SERVICE MANUAL

SANYO

ECR105/115

ELECTRONIC CASH REGISTER
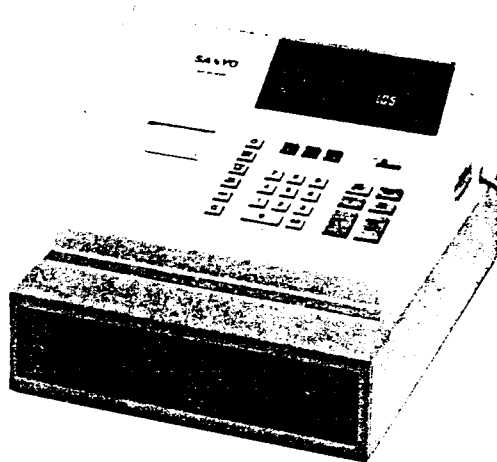
ECR105
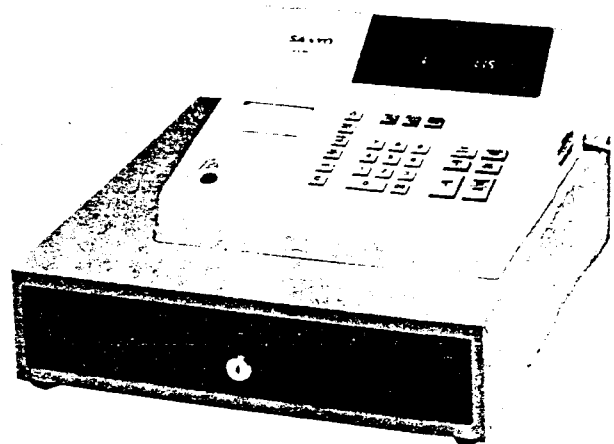
ECR115

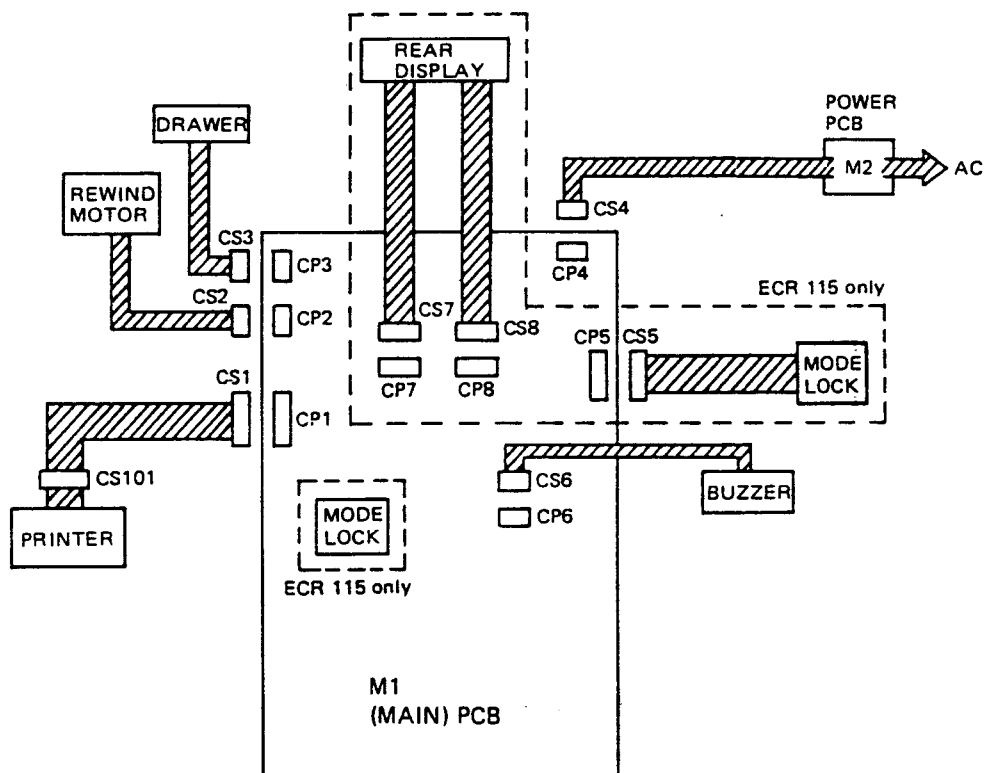## SPECIFICATIONS

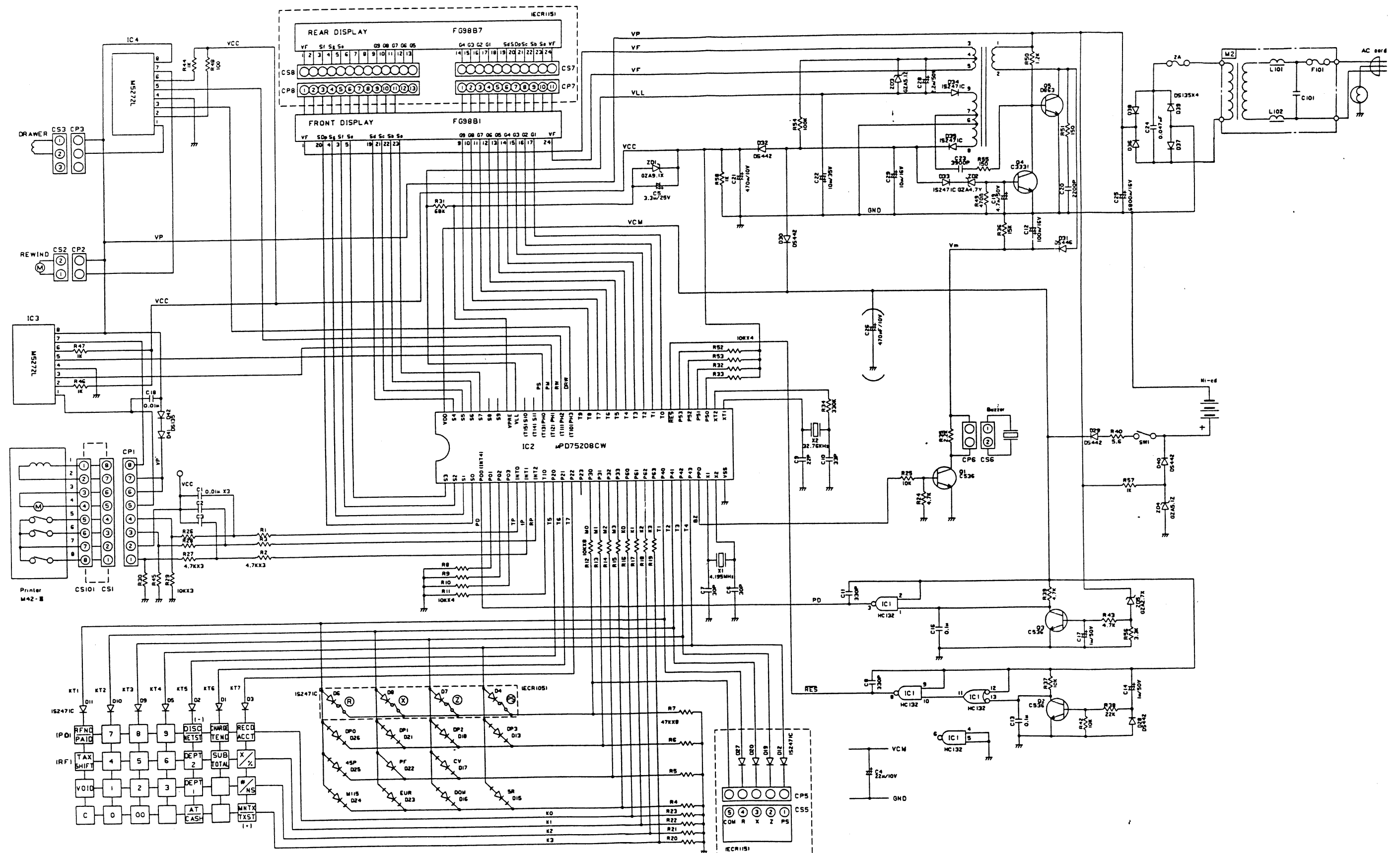|	
Number of Departments:	2
Number of totals:	9
Battery:	Rechargeable Ni-Cd batteries for memory protection
Memory holding time:	Approx. 1.000 hours without Power supply from AC
Printer:	Digital wheel type serial printer 14-digits for numeric and 1 digit for symbol
Indicator:	Green fluorescent multi digits display tube 1 digit for symbol + 1 digit for repeat counter + 7-digits for amount
Number of figures for input:	Up to 7 digits: Ten key system Multiplication: Quantity $\leqq$ 4-digits Price $\leqq$ 5-digits Result $\leqq$ 7-digits Number print $\leqq$ 8-digits
Number of figures for total:	Non-resettable GT: 12-digits Other amount total: 8-digits Counters: 4-digits
Roll paper:	57.5mm x Max. 80 (ϕ) mm
Inking:	Ink roll R-S874274 (Purple)
Operation temperature:	0 ~ 40°C (32 ~ 104°F)
Power supply:	AC Local Voltage ± 10%, 50/60 Hz
Power consumption:	Max, 6W
Dimension:	318(W) x 408(D) x 242(H) mm (ECR105) 405(W) x 423(D) x 250(H) mm (ECR115)
Weight:	Net 5.8Kg (ECR105) Net 8.0Kg (ECR115)

INDEX

CABLE CONNECTION DIAGRAM

SCHEMATIC DIAGRAM

7

P.C. BOARD DIAGRAM

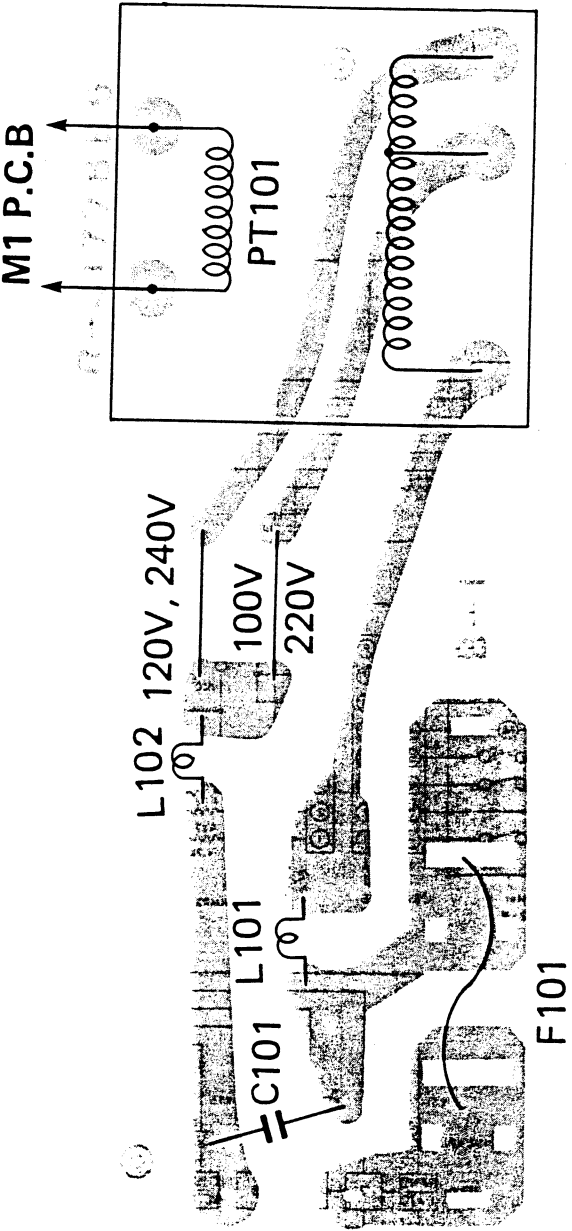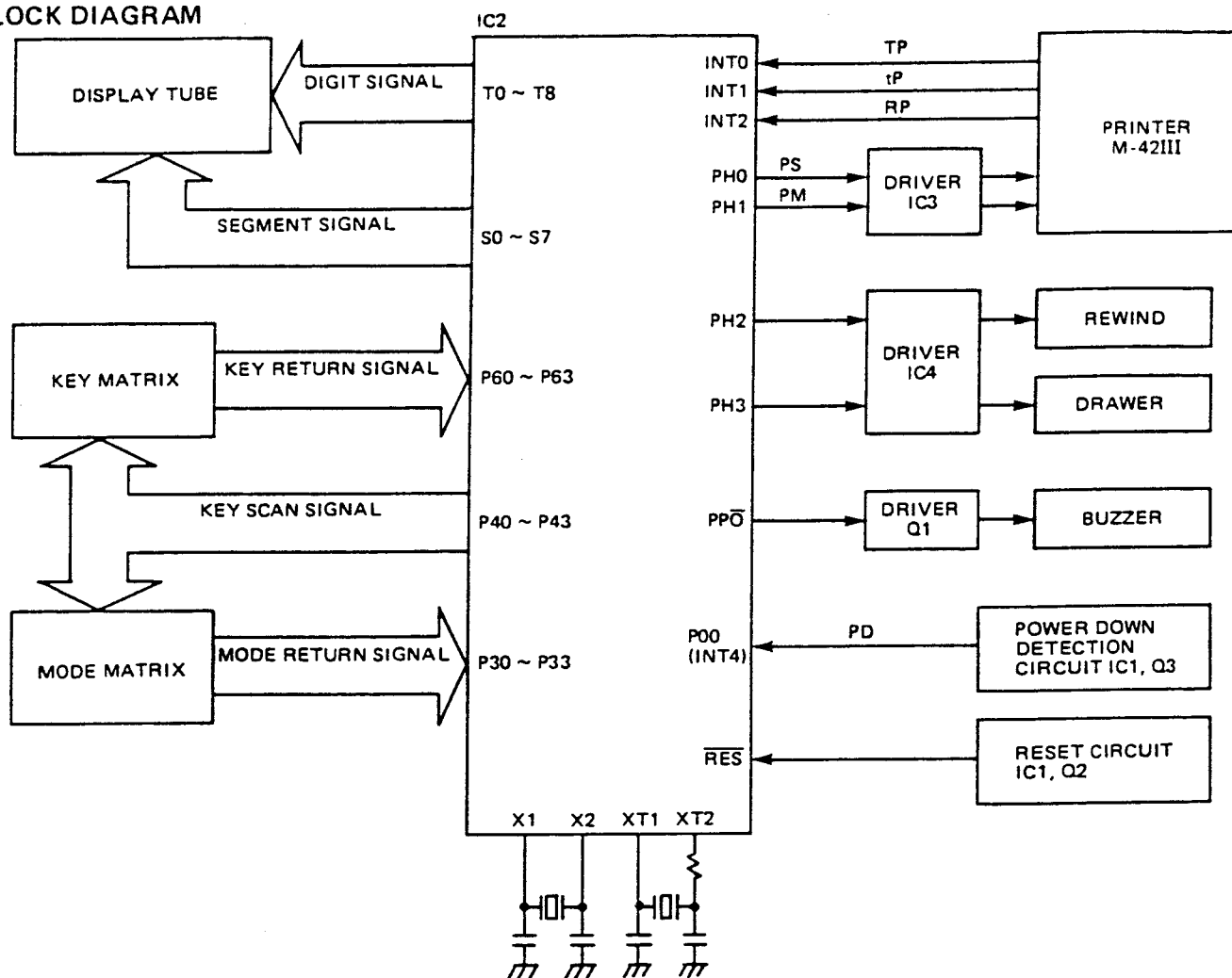## M1 P.C.B
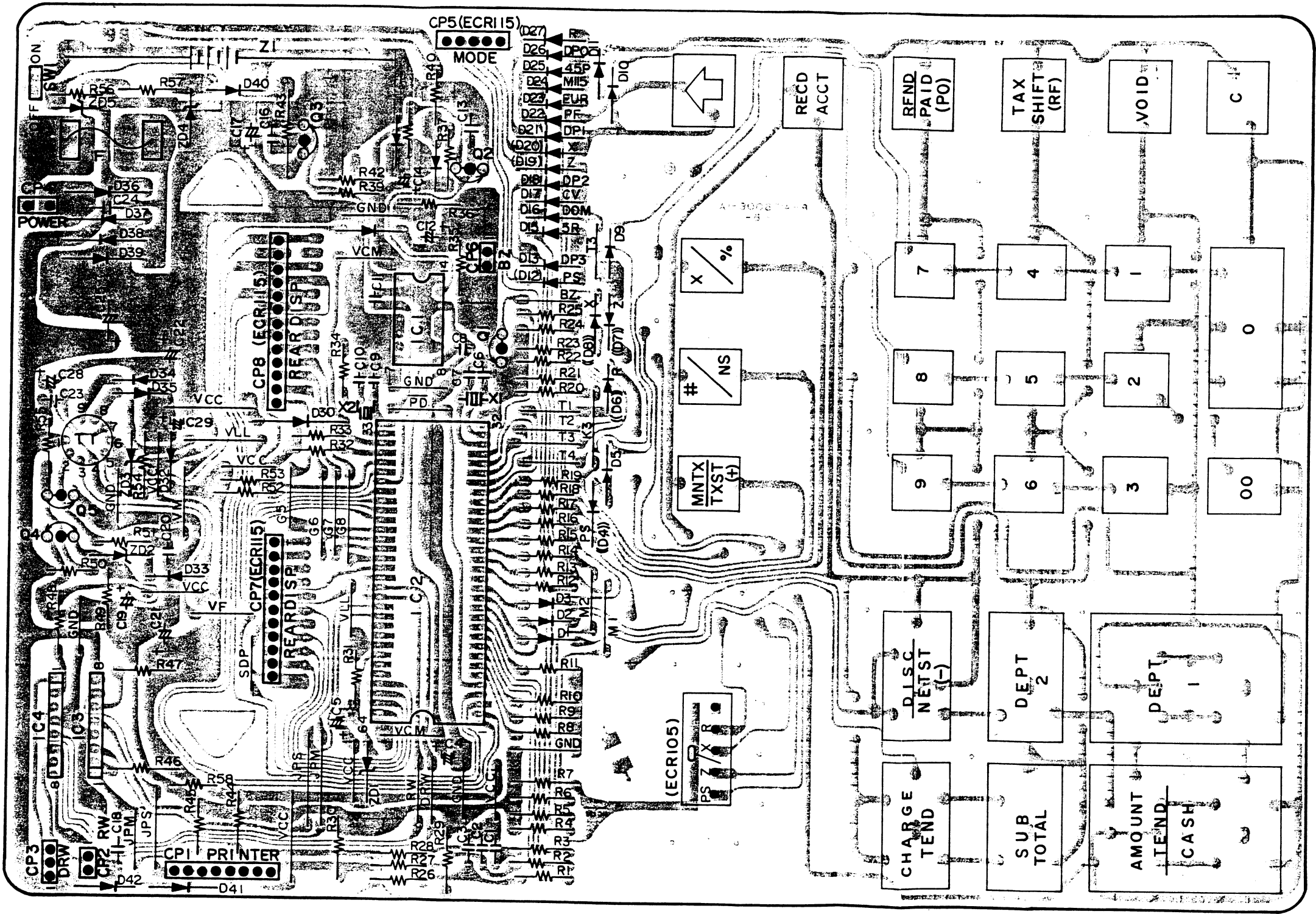
NOTE: ( ) bracket diode is for ECR 115 only.
(( )) bracket diode is for ECR 105 only.

M2 P.C.B

BLOCK DIAGRAM

OPENING THE UNIT

1. Disassembling.
(1) Disconnect AC cord.
(2) Detach the printer cover.
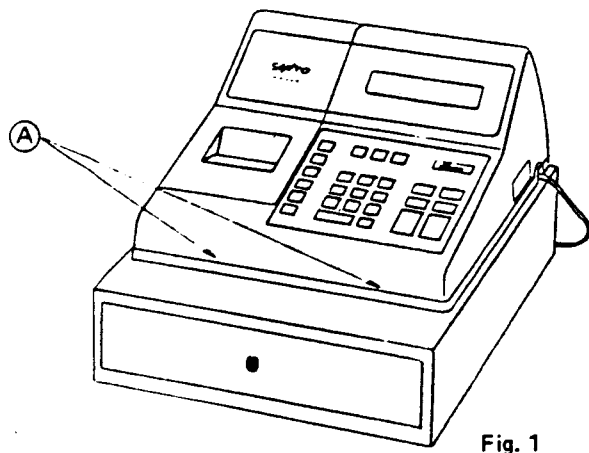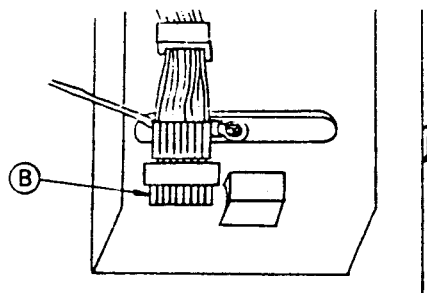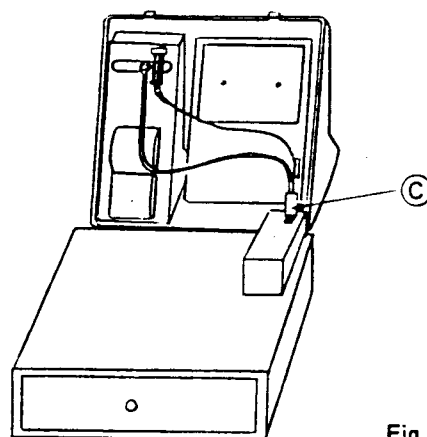(3) Push and lift the loweredge of cabinet (Ⓐ).

Fig. 1

Fig. 2

Fig. 3

2. Removing the printer.
(1) Disconnect the flat cable (Ⓑ) and earth line (Ⓒ).

(2) Pull the hook (D) and lift the printer.
(3) Removing the printer from cabinet.
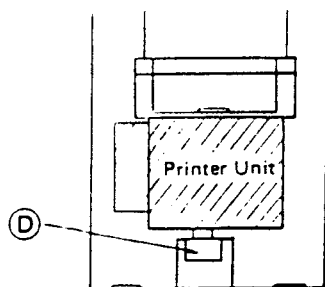
Fig. 4

3. Removing the main PCB.
(1) Turn off the battery switch located beside the Nicd battery.
(2) Disconnect the connector of power, printer and etc.
(3) Removintg 4 screws fastening the main PCB and metal.
(4) Push 2 hooks (E) and take out the metal.
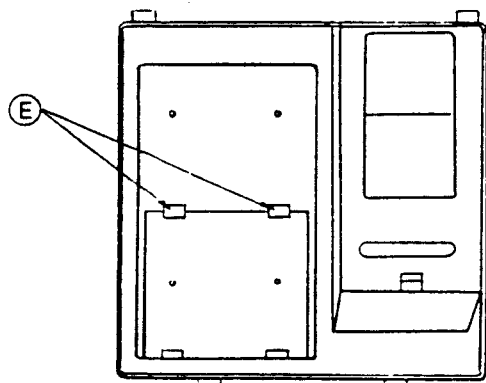
Fig. 5

(5) Removing the main PCB from cabinet.

REASSEMBLING

(1) Avoid misconnection between connector and terminal of PCB, confirm the connection is correct and tight it.
(2) Plug in AC cord at first, then turn on the battery switch.

CLEAR THE NON-RESETTABLE TOTAL AND Z-COUNTER

It is possible to clear the Non-resettable total and Z-counter by the following key operation.

(P Mode)

(1) 9 0 0 0
(2) VOID
(3) CASH

This operation will clear all totals maintained in the memory to zero (except the date and time), and printout all characters. (Fig. A)

```
00000000000000 0 Z
11111111111111 0 1
22222222222222 0 2
33333333333333 0 3
44444444444444 0 4
55555555555555 0 0
66666666666666 0 +
77777777777777 0 −
88688888888888 0 X
99999999999999 0 0
--------------
, , , , , , , , , , , , , * #
. . . . . . . . . . . . . % 0
# # # # # # # # # # # # # # # 0 0
```

Fig. A

SETTING OPTIONAL SELECTIONS

(1) Shift of decimal point
The number of digits after the decimal point can be selected out of DP = 0, 1, 2 and 3 by diodes at the location marked DP0, DP1, DP2 and DP3. (Fig. 6)

DP0, DP1, DP2 and DP3. (Fig. 6)
(D26)(D21)(D18)   (D13)

(2) 5 Rappen rounding (for Swiss market)
The least significant digit of the result of % or tax calculation will be rounded to 0 or 5 as follows:

Normal calculation	:	Round to
0 ~ 2	:	0
3 ~ 7	:	5
8 ~ 9	:	10

(3) Department (M115 : D24), Paper feed (PF : D22)
These diodes should be always mounted.

Fig. 6

A C
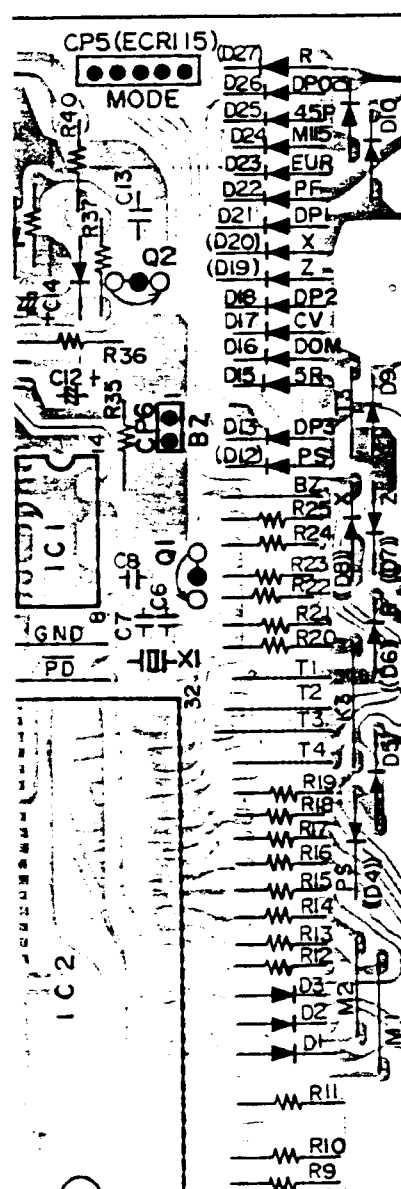
(4) % Mode, Tax Mode, Japan Mode
These mode can be selected by diodes at the location marked EUR (D23) and DOM (D16). (Fig. 6)
The combinations are shown in the following table.

	EUR	DOM
% Mode	O	X
Tax Mode	X	X
Japan Mode	X	O

O : Add the diode.
X : Do not add the diode.

Besides the above selection it is necessary to change rubber key.

(5) Don't use diodes at the location marked D14, D17 (CV) and D25 (45P). (Fig. 6)
(6) Mode switch selections
ECR 105: Add the diodes marked D4 (PS), D6 (R), D7 (Z) and D8 (X). (Fig. 6)
ECR 115: Add the diodes marked D12 (PS), D19 (Z), D20(X), D27(R). (Fig. 6)

DEVICE SPECIFICATIONS

IC2 μPD75208

The μPD75208 is a general purpose single chip 4 bit microcomputer. This is fabricated with C MOS technology.
This contains a ROM, a RAM, I/O Ports, a fluorescent display controller/driver, etc.

The μPD75208 is packaged in a type of 64 PIN shrink plastic DIP package (μPD75208CW).

Absolute Maximum Ratings (Ta = 25°C)

Power Supply Voltage	V_{DD}	−0.3 to +7.0	V
	V_{LOAD}	V_{DD}−40 to V_{DD}+0.3	V
	V_{PRE}	V_{DD}−12 to V_{DD}+0.3	V
Input Voltage	V_I	−0.3 to V_{DD}+0.3	V
Operation Temperature	T_{opt}	−10 to +70	°C
Storage Temperature	T_{stg}	−65 to +150	°C

Pin Configuration (Top View)

Left side (pins 1–32):
S3 (1), S2 (2), S1 (3), S0 (4), P00/INT4 (5), P01/$\overline{SCK}$ (6), P02/SO (7), P03/SI (8), P10/INT0 (9), P11/INT1 (10), P12/INT2 (11), P13/TI0 (12), P20 (13), P21 (14), P22 (15), P23/BUZ (16), P30 (17), P31 (18), P32 (19), P33 (20), P60 (21), P61 (22), P62 (23), P63 (24), P40 (25), P41 (26), P42 (27), P43 (28), PPO (29), XI (30), X2 (31), Vss (32)

Right side (pins 33–64):
XT1 (33), XT2 (34), PS0 (35), PS1 (36), PS2 (37), PS3 (38), $\overline{RESET}$ (39), T0 (40), T1 (41), T2 (42), T3 (43), T4 (44), T5 (45), T6 (46), T7 (47), T8 (48), T9 (49), T10/PH3 (50), T11/PH2 (51), T12/PH1 (52), T13/PH0 (53), T14/S11 (54), T15/S10 (55), V_{LOAD} (56), V_{PRE} (57), S9 (58), S8 (59), S7 (60), S6 (61), S5 (62), S4 (63), V_{DD} (64)

μPD75208CW

Fig. 7

Parameter	Symbol	Test Conditions	Ratings	Unit
Output voltage	Vo	Except display output pins	−0.3 to V_{DD}+0.3	V
	VOD	Display output pins	V_{DD}−40 to V_{DD}+0.3	V
Output Current High	IOH	Per pin, except display output pins	−15	mA
		Per pin, S0 to S9	−15	mA
		Per pin, T0 to T15	−30	mA
		Total, except display output pins	−20	mA
		Total, display output pins	−120	mA
Output Current Low	IOL	Per pin	17	mA
		Total, all outputs	60	mA
Total Power (1) Consumption	PT	Plastic Shrink DIP	600	mW

Signal description (μPD 75208)

No.	Pin name	Signal name	I/O	Description
1	S3	Se	O	Segment signal
2	S2	Sf	O	"
3	S1	Sg	O	"
4	S0	SDP	O	"
5	P00/INT4	PD	I	Power down signal
6	P01 $\overline{SCK}$	NC	—	Not use
7	P02 SO	NC	—	"
8	P03/SI	NC	—	"
9	P10/INT0	TP	I	Timing pulse
10	P11/INT1	tP	I	Timing auxiliary pulse
11	P12/INT2	RP	I	Reset pulse
12	P13/TIO	NC	—	Not use
13	P20	T5	O	Key scan signal
14	P21	T6	O	"
15	P22	T7	O	"
16	P23/BUZ	NC	—	Not use
17	P30	M0	I	Key return signal
18	P31	M1	I	"
19	P32	M2	I	"
20	P33	M3	I	"
21	P60	K0	I	"
22	P61	K1	I	"
23	P62	K2	I	"
24	P63	K3	I	"
25	P40	T1	O	Key scan signal
26	P41	T2	O	"
27	P42	T3	O	"
28	P43	T4	O	"
29	PP0	BZ	O	Buzzer signal
30	X1	X1	—	Main clock
31	X2	X2	—	"
32	Vss	GND	—	0V
33	XT1	XT1	—	Sub clock
34	XT2	XT2	—	"
35	P50		—	Not use
36	P51		—	"
37	P52		—	"
38	P53		—	"
39	$\overline{RESET}$	$\overline{RES}$	I	Power on reset signal
40	T0	G1	O	Digit signal
41	T1	G2	O	"
42	T2	G3	O	"
43	T3	G4	O	"
44	T4	G5	O	"
45	T5	G6	O	"
46	T6	G7	O	"
47	T7	G8	O	"
48	T8	G9	O	"
49	T9	NC	—	Not use
50	T10/PH3	DRW	O	Drawer open signal
51	T11/PH2	RW	O	Rewind motor drive signal
52	T12/PH1	PM	O	Printer Motor Signal
53	T13/PH0	PS	O	Printer Solenoid Signal
54	T14/S11		—	Not use
55	T15/S10		—	Not use
56	VLOAD	VLL	—	−23V
57	VPRE	VPRE	—	−3.6V
58	S9		—	Not use
59	S8		—	"
60	S7	Sa	O	Segment signal
61	S6	Sb	O	"
62	S5	Sc	O	"
63	S4	Sd	O	"
64	VDD	VCM	—	5V

IC1 TC 74HC132P

· QUAD 2-INPUT SCHMITT NAND GATE

Pin Configuration

1 A [1]	[14] Vcc
1 B [2]	[13] 4 B
1 Y [3]	[12] 4 A
2 A [4]	[11] 4 Y
2 B [5]	[10] 3 B
2 Y [6]	[9] 3 A
GND [7]	[8] 3 Y
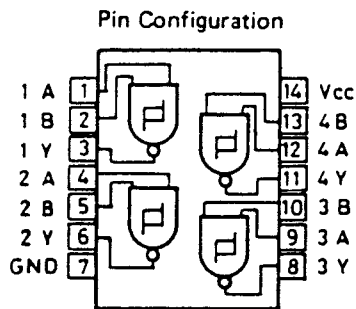
Fig. 8

IC3, IC4 M5272L

· Current driver (high active type)

| OUT 1 [1] |
| DRIVE 1 [2] |
| IN 1 [3] |
| GND [4] |
| IN 2 [5] |
| DRIVE 2 [6] |
| OUT 2 [7] |
| CLAMP [8] |
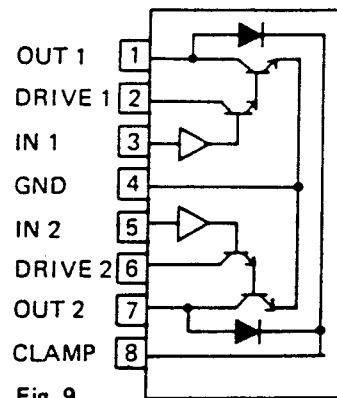
Fig. 9

Output – function

IN	OUT
L	H (OFF)
H	L (ON)

TRANSISTOR		ABSOLUTE MAXIMUM RATING					hfe			fT (MHz)
TYPE NO.	USE	VCBO (V)	VCEO (V)	VEBO (V)	IC (mA)	PC (mW)	hfe	VCE (V)	IC (mA)	
2SC3331	LF Amplifier	60	50	6	200	500	100 ~ 800	6	1	200
2SD863	Voltage regulator	60	50	5	1A	900	100 ~ 200	2	50	150
2SC536	Small signal Amplifier	40	30	5	100	400	100 ~ 200	6	1	100
2SC945	LF Amplifier	60	50	5	100	250	200 ~ 400	6	1	250

CIRCUIT
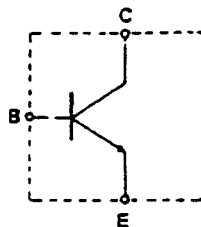
DRAWING

< Bottom view >

DIODE		ABSOLUTE MAXIMUM RATING					
TYPE NO.	USE	VRM (V)	VR (V)	IFM (mA)	IO (mA)	ISURGE (mA)	
IS2471C	High speed switching	130	120	400	130	600	VF = 1.2V (IF 0.1A)
IS2473	High speed switching	40	35	350	110	400	VF = 1.2V (IF 0.1A)
DS442	High speed switching	35	30	360	120	500	VF = 0.68V (IF = 1.5mA)
DS135	Rectifier	200	–	–	1A	50A	VF = 1V (IF = 1A)
DSF10	Rectifier	200	–	–	1A	45A	VF = 1V (IF = 1A)

ZENER DIODE	ABSOLUTE MAXIMUM RATING			VZ			IR (μA)	VR (V)
TYPE NO.	P (mW)	P peak (mW)	IZM (mA)	Min. (V)	Max. (V)	IZ (mA)		
GAZ2.7X	500	1250	130	2.50	2.75	10	100	1
GZA4.7Y	500	1250	90	4.65	5.00	10	10	1
GZA5.1Z	500	1250	86	5.10	5.40	5	1	1
GZA9.1X	500	1250	52	8.60	9.05	5	0.5	7

DESCRIPTION OF CIRCUITS

General Description

(ECR115 only)

Fig. 10

Power Supply Section

V_p – GND : 8.6V typ.
V_p' – GND : 7.4V typ.
V_{LL} – GND : –23V typ.
V_{CC} – GND : 5.0V typ.
V_{CM} – GND : 5.0V typ.
              (While AC is supplied)
V_F – V_F : 3.8V AC typ. (V.E.)
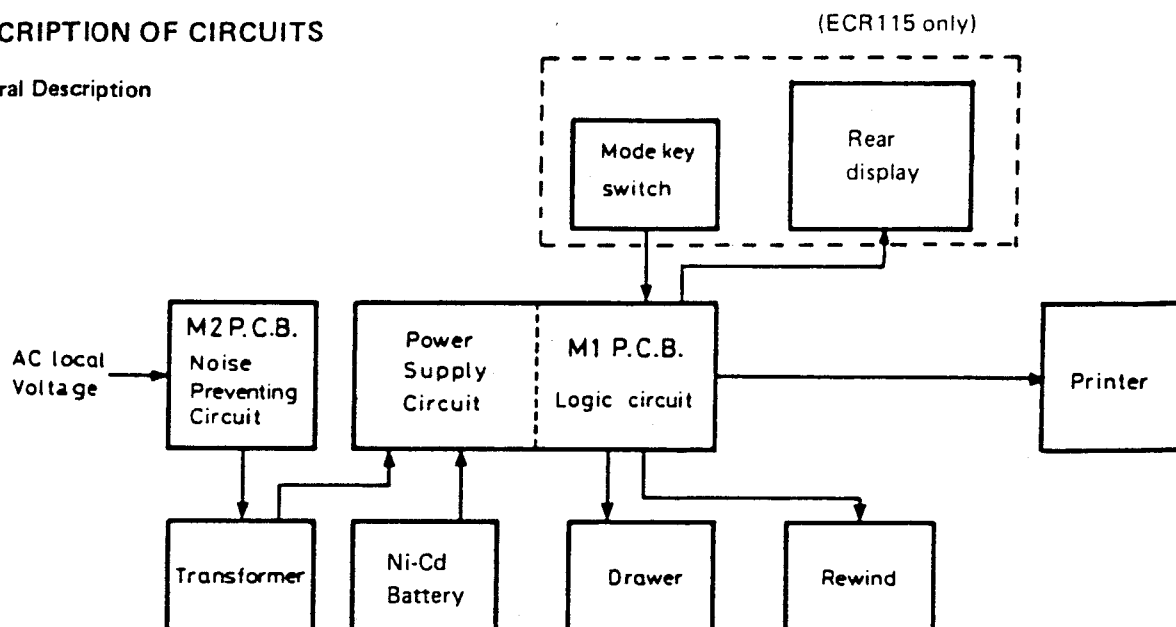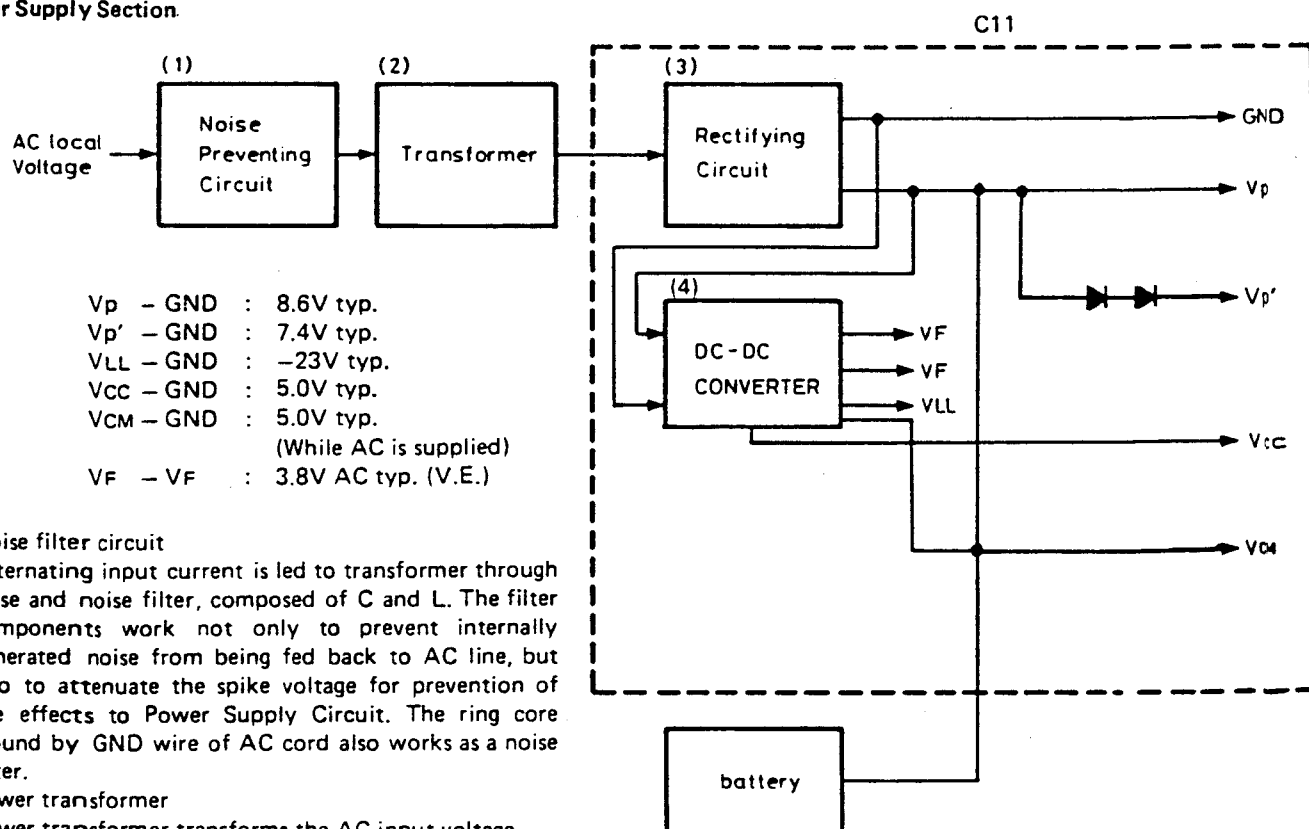
(1) Noise filter circuit
Alternating input current is led to transformer through Fuse and noise filter, composed of C and L. The filter components work not only to prevent internally generated noise from being fed back to AC line, but also to attenuate the spike voltage for prevention of the effects to Power Supply Circuit. The ring core wound by GND wire of AC cord also works as a noise filter.

(2) Power transformer
Power transformer transforms the AC input voltage.

R-W770861   : for AC 100/115V
R-W770861-1 : for AC 220/240V

(3) Rectifying circuit
AC input, having transformed by power transformer, is bridge-rectified by diode D36 ~ D39 and C25. The voltage after rectification is 4 ~ 10VDC for the rated input.

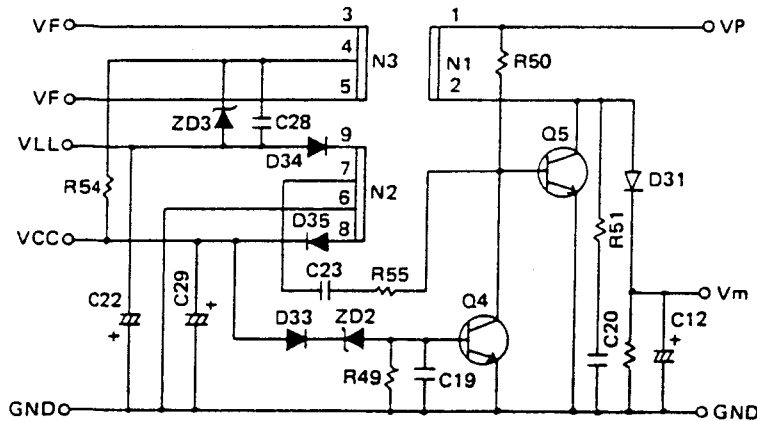Fig. 11

(4) DC-DC converter

Fig. 12

At the power on, Q5 turns ON by the base current through R50. The collector current of Q5 generates the voltage on the winding N1 and N2. The positive voltage on the terminal 7 for the terminal 6 (GND) increases the collector current of Q5 through R55 and C23. When the transformer gets satulated, the Q5 turns OFF. After some period, the level of the base of Q5 goes up by the charge current through R50, and Q5 turns ON again.

The circuit repeats this cycle. Thus the voltage is generated on N1, N2 and N3. D34 and D35 rectifies the voltage of N2. When Vcc exceeds the specified zener voltage, the current flows through ZD2 and D33 and turns Q4 ON and Q5 OFF to regulate Vcc and VLL to the specified voltage.
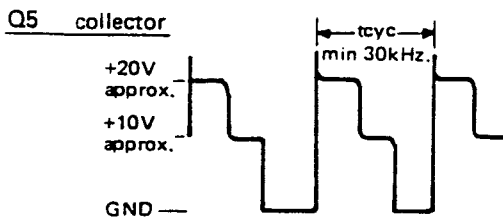
Fig. 13

Display

The μPD75208 has a built-in display controller which reads out the contents of the display memory and automatically generates digit and segment signals and a high voltage output buffer which can directly drive fluorescent display. The output of timing signals and segment signals are as follows. (Fig. 14)
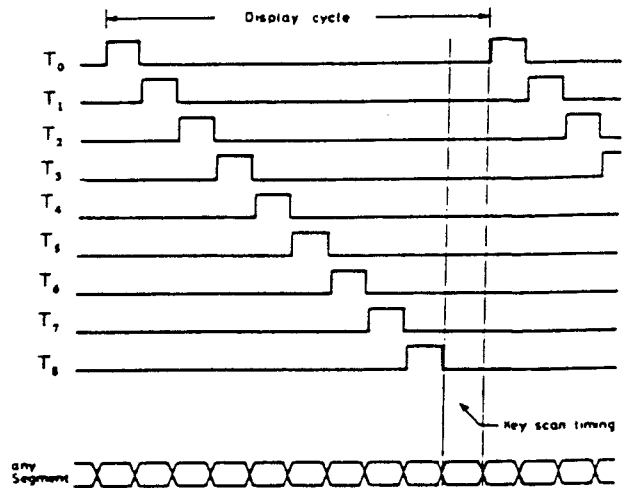
Fig. 14
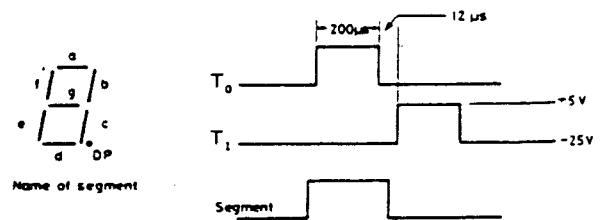
Fig. 15

Key scan

KT1 ~ KT7 are provided as inputs for numeric keys and function keys from CPU (IC2). When a key is depressed. KTn (KT1 ~ KT7) pulse appears on Km (K0 ~ K3) line through the keyboard. Then CPU catches the pulse and decides which order to perform by matching it up with the signal CPU discharged. Also, KTn signal is used for mode control lock.

In case of depressing ①Key
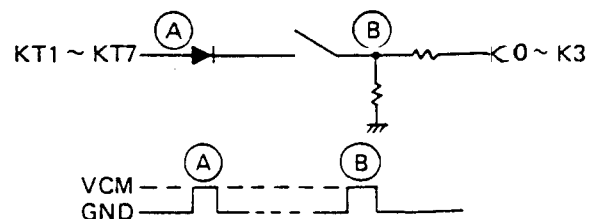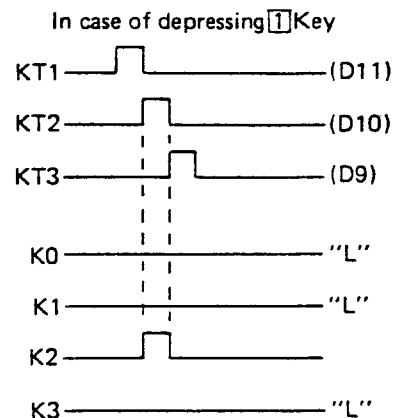
Fig. 16

Power down detecting circuit

This circuit detects the power failure or the power-on and generates PD signal to keep memory or to prevent the circuit from erroneous operation in the unstable traditional period of power supply.

The level Vp drops when the AC power supply is turned off or when an instantaneous power failure occurs. The circuit detects the Vpp falling down less than some 2.3V and make the PD signal Low-level. On receiving PD signal the CPU shelters the present program counter and the contents of each register from extinction. Also the CPU stops the clock oscillation of X1 (4.19MHz) to save the power consumption. When AC power supply is turned on, PD signal is recovered High-level. CPU will active again.
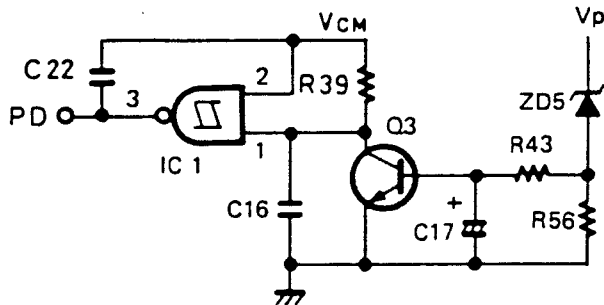
Fig. 17
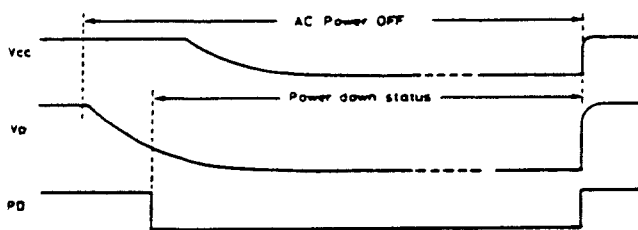
Fig. 18

Reset circuit

This circuit generates $\overline{RES}$ signal. Reset signals reset the CPU. This signal is generated by turning on the AC with VcM lower than about 2.6 volts. If the battery voltage is normal, this signal is not generated even if the AC is off.
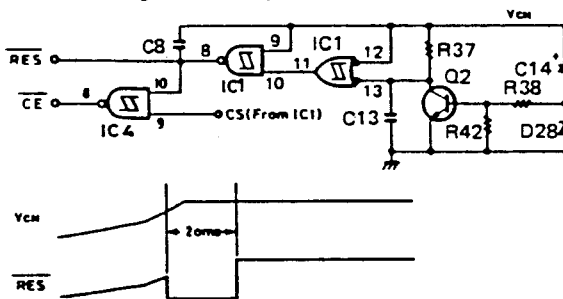
Fig. 19

Buzzer circuit

When the numeric key is depressed or error inputs has been done, the CPU (IC2) generates a buzzer signal. The signal is driven by transistor Q1 and the buzzer sounds.

Fig. 20

Fig. 21

Drawer circuit

When the CPU outputs high level, IC4 (1 pin) turns on to drive the solenoid of drawer.

Fig. 22

Rewind circuit

Rewind motor controls RW signal. It is active, when printer works.

Fig. 23

CPU clock oscillation

Fig. 24

Printing of one line (printing of four columns "6. RF—")

Continuous printing (indicated by a line ___)

Operation	Selection	Printing and advancing	Selection	Printing and advancing	Selection	Printing and advancing	Selection	Printing	Paper feeding and carriage return (21 cl.)	Printing and advancing	Selection

(MAX.) (Eqsivalent to 10cl.) (MIN.) (Equivalent to 10cl.) (Equivalent to 10cl.) 14cl. 7cl. (Equivalent to 10cl.)

*5)
(Equivalent to 10 cl.)

*1) Motor drive pulse signal

Reset pulse signal R

*1) Reset pulse RP

Timing pulse signal T

Timing auxiliary pulse signal t

*1) Timing pulse TP

*1) Trigger coil drive pulse

Rotation of print wheel

Movement of print wheel in the column direction

Operation of hammer

Operation of carriage

Operation of positioning plate

Paper feeding clutch

Paper feeding

*3)   *4)

0 1 2 6 7 8 *3)4)   9 10 11 12 13 0 1 2 3 4 5 6 7 8 9 10   1 1 12 13   0 1 2 3 4 5 6 7   8 9 10 11 3 4 5 6 7 8 9 10 11 12 13 0 1   2 3 4

TW1   TW1×4   TW2   TW1×6 *2)

"—"   "RF"   ". ."   "6"   "Z"

Quick paper feeding (for two lines)   Paper feeding 1 cycle (equivalent to 38 cl.)   (Equivalent to 25cl.)   Stop

(Equivalent to 10cl.)   (Equivalent to 10cl.)   14cl.

*1) Motor drive pulse signal

*1) Reset pulse RP

*1) Timing pulse TP

*1) Trigger coil drive pulse

Rotation of print wheel

Operation of hammer

Operation of positioning plate

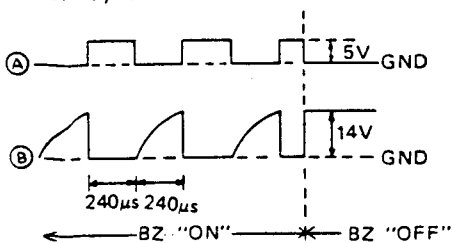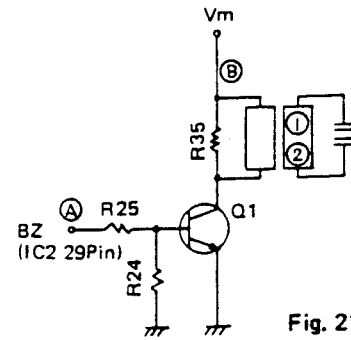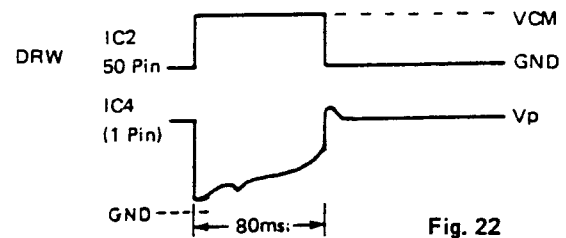Paper feeding clutch

Paper feeding

0 1 2 3 4 5 6 7 8 9 10 11   13   0 1 2 3 4 5 6 7 8 9 10 12   11 13   0 1 2 3 4 5 6 7 8 9 10 11   12 13 0 1 2 3 4 5 6 7 8 9 10 11 130

TW1   TW1×6 *2)   TW1   TW1×6 *2)

Empty   Empty

Notes: *1) The signals and pulses in ⬚ have to be provided by the user of this printer.
*2) For the width of the trigger coil drive pulse for the top column in a line, the value equivalent to six times as large as the timing pulse interval for selecting the first column should be added to the timing pulse interval TW2 at the time of selection. Similarly, the value equivalent to six times as large as TW1 should be added to the timing pulse TW1 at the time of selection (empty position) during the paper feeding.

Fig. 25

*3) The timing pulse signal T for printing and advancing may be indicated by a broken line.
*4) The timing auxiliary pulse signal t for printing and advancing may remain in a state of "make" within the time four times as long as the timing pulse interval TW1 for selecting the first column, and it may be in a state of "break" in other areas of printing and column advancing. In this case,if the timing auxiliary pulse signal t is in a state of "make", the timing pulse signal T is made until the final point within the time four times as long as the timing pulse interval TW1 or is not made until the final point for printing and advancing.
*5) cl. represents the cycle of timing pulse.
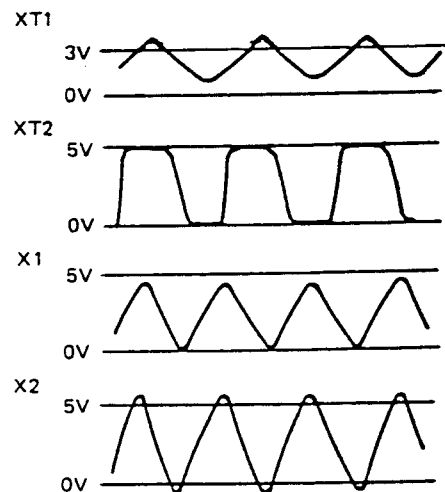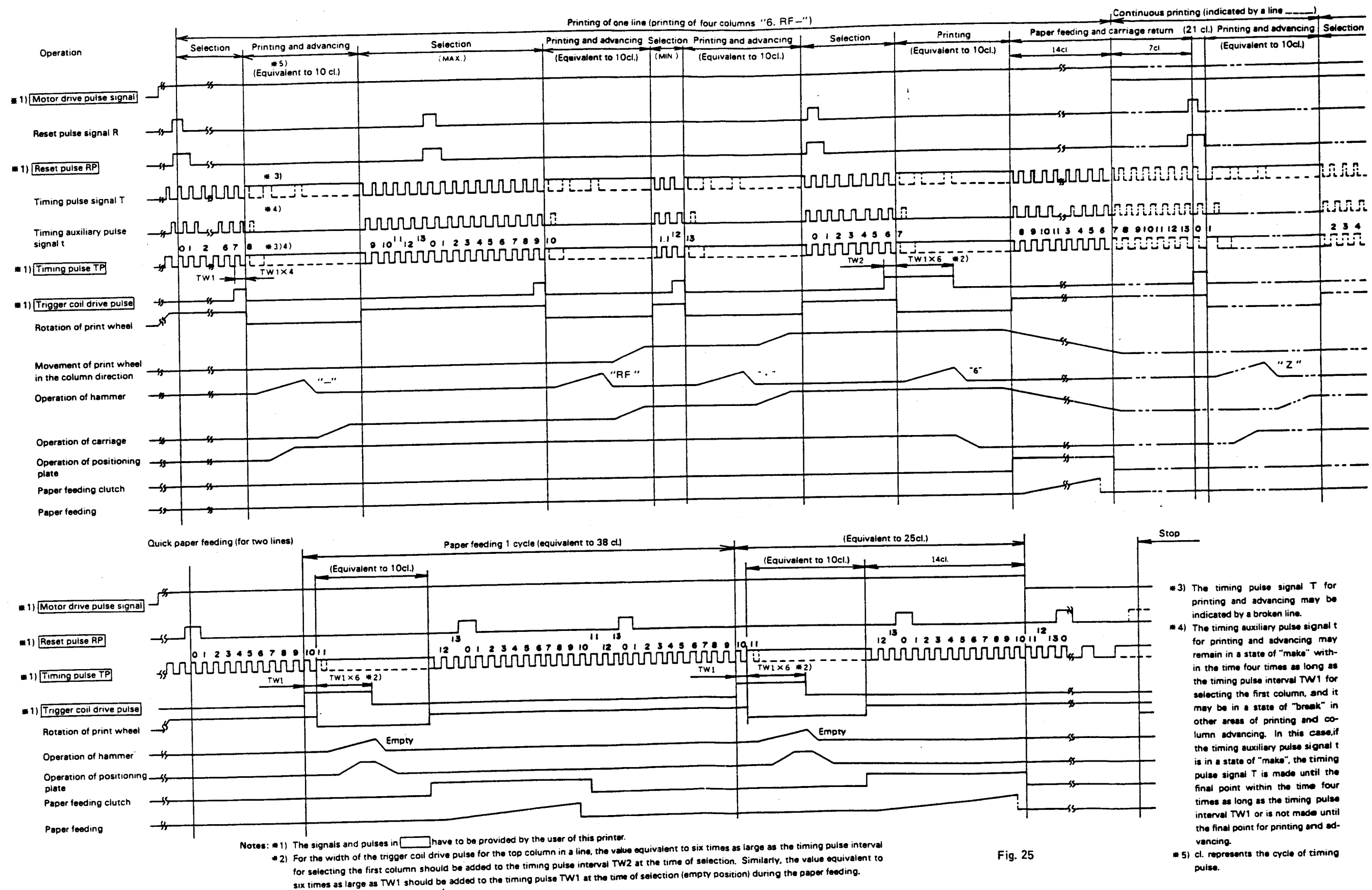
PRINTER

Timing detecting

The detecting mechanism of this printer employs a mechanical contact system. It generates two series of signals (Timing pulse signal T and Timing auxiliary pulse signal t) corresponding to the types on the print wheels, and also generates a Reset pulse signal R per one rotation of the print wheel.

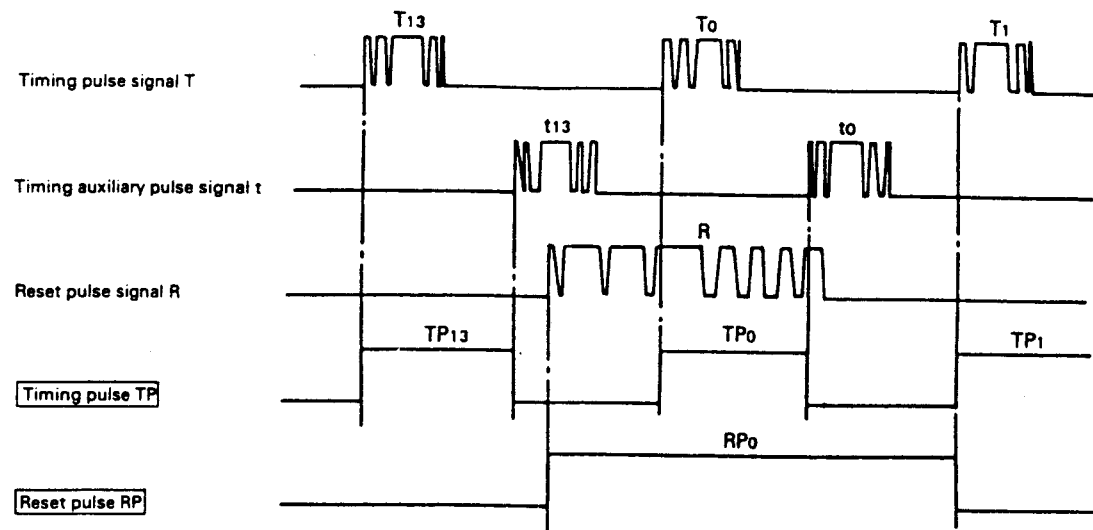The signals thus obtained are shaped and used as the timing pulse signal and the reset pulse signal.
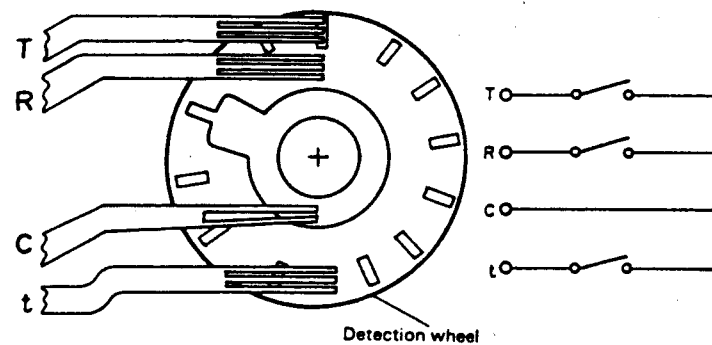

Fig. 26

Fig. 27

PRINTER OPERATION DURING ONE PRINT CYCLE

The printer operation during one print cycle is described, referring to Fig. 25.

(1) Initialization

It is necessary to perform the required initialization prior to printing or paper feeding in orded to confirm that the carriage remains in the waiting state (for the first column). The initialization is finished by feeding the paper by one line.

(2) Printing of one line

1 The printer counts the timing pulse TP after applying the motor drive pulse signal to run the motor. The reset pulse RP after counting eight pulses is set as RP0, and the first timing pulse TP after the reset pulse RP0 has been generated in set as TP0.

2 Selection of type

Apply the trigger coil drive pulse to the trigger magnet between the timing pulses TPn and TPn + 1 which correspond to the desired type.

Simultaneously, measure the timing pulse interval between TPn and TPn + 1 to obtain TW1.

After the desired type has been selected, the print wheel will stop (the timing pulse remains to be TPn + 1) and advancement will be performed automatically.

3 Selection of type for the next line

The print wheel starts running again to cause the first timing pulse to be TPn + 2, permitting the type selection from the second time pulse TPn + 3. Then, the type selection is performed in the same manner as in Item 2 above.

4 Carriage return and paper feeding

When the type for the top column in one line printing, the carriage return and paper feeding are performed by adding the timing pulse interval TW2 between TPn and TPn + 1 and the value equivalent to six times as large as the TP interval TW1 measured for the type selection for the first column in Item 2 above to the width of the trigger coil drive pulse.

5 Turning the motor OFF

When the top column in one line printing has been printed, the print wheel starts running and generates the timing pulse TP. Interrupt the motor drive signal at the fourteenth timing pulse TP after counting the pulses from the first pulse generated.

Notes:

1) Confirm the reset pulse between the timing pulses TP13 and TP0 during the one line printing cycle.

2) The first timing pulse generated after the advancing operation cannot be used for the type selection.

(3) Continuous printing

1 The first line is printed in the same manner as in the case of the first line in Item (2) above.

2 For printing of the lines from the second line on, the subsequent timing pulse TP is counted while the motor is running, whereby permitting the printing of the first column in the second line after the twenty-first pulse is generated, as in the case of "Printing of one line" 2 , 3 and 4 in Item (2) above.

3 Continuous printing is performed by repeating the operation described in 2 above.

4 Turning the motor OFF

The operation described in 5 of Item (2) above is performed. (The motor is turned OFF for one line printing.)

(4) Paper feeding for one line

1 The timing pulse TP after starting the motor by applying the motor drive pulse signal is counted, and the reset pulse RP after counting the eighth pulse is set as RP0 and the first timing pulse TP after the reset pulse RP0 is generated is set as TP0.

2 Paper feeding

The empty type (TP10) is selected. Simultaneously, the timing pulse interval between TP10 and TP11 is measured to obtain TW1. It is made possible to select the empty type on the print wheel and to feed the paper by adding the measured TW1 and the value equivalent to six times as large as TW1 to the width of the trigger coil drive pulse.

3 Turning the motor OFF

After the paper has been fed for one line, the print wheel starts running, and the motor drive pulse signal is interrupted as the fourteenth timing pulse TP generated after counting the timing pulses from the first timing pulse generated.

Note:

Confirm the reset pulse RP between the timing pulses TP13 and TP0 during the one line paper feeding cycle.

(5) Quick paper feeding

1 The paper is fed the first one line in the same manner as in the case of 2 in Item (4) "Paper feeding for one line".

2 For printing of the lines from the second line on, the subsequent timing pulse TP is counted while the motor is running, whereby permitting the selection of the empty type (TP10) from the twenty-first pulse generated, as in the case of 2 in Item (4) "Paper feeding for one line".

3 Quick paper feeding is performed by repeating the operation described in 2 above.

4 Turning the motor OFF

The operation described in 3 of Item (4) is performed. (The motor is turned OFF for one line paper feeding.)

Drum Pattern

Fig. 28

Specifications

1.1 Features

The Micro Serial Printer Model-42III is designed to print the results obtained from hand held electronic calculator and has the following features.

(1) Very compact, light-weight design.
(2) Clear print quality avaiable.
(3) Carriage return is possible in any position, resulting in inherent high-speed printing.
(4) Quiet drive and minimized printing noise.
(5) Quick paper feeding and paper release are possible.
(6) Power is supplied by UM-3 manganic battery cells when necessary (low power drive).
(7) Ordinary paper can be used.
(8) Motor speed control is not necessary.

1.2 Specifications

The specifications of Model-42III are shown below. For further details needed for your circuit and housing design, refer to the separate "SPECIFICATIONS OF Model-42III" and "GUIDE TO CIRCUIT AND HOUSING DESIGN FOR Model-42III.

1.	Printing system	: Print wheel selecting type serial printer
2.	Print column capacity	: 19 columns max.
3.	Character position	: Symbol column 13 positions + 1 empty position
		Numeral column 14 positions
4.	Character size	: 1.6mm(W) x 2.3mm(H)
5.	Character spacing	
	1) Column spacing	: 2.1mm between numerics, 2.6mm between numeric and symbol, 2.3mm between symbols
	2) Line spacing	: 4.6mm
6.	Printing speed	(Average speed at 6.0 VDC)
	1) 19 columns	: Approx. 0.9 line/sec.
	2) 7 columns	: Approx. 2.2 line/sec.
7.	Printing paper roll	
	1) Type of paper	: Ordinary paper
	2) Paper width	: 57.5 ± 0.5mm
	3) Outside diameter	: ϕ80mm or below
	4) Paper thickness	: 0.06 ~ 0.85mm
	5) Basis weight	: 47 ~ 64 g/m² (40 ~ 55 kg/1000 sheets/1091 x 788mm)
8.	Paper feeding	: Quick feed; Approx. 8 line/sec, paper release mechanism attached.
9.	Inking	
	Ink roller	
	1) Color	: Purple or black
	2) Life	: Refer to the separate "SPECIFICATIONS OF Model-42III".
	3) Standard	: IR-40
10.	Motor	
	1) Terminal voltage	: $6.0^{+0.5}_{-2.0}$ VDC
	2) Mean current	: Approx. 0.25A (at 6.0 VDC, 25°C, 19 columns 7-character shift printing)
11.	Detector	: Mechanical contact
		Reset pulse signal R, timing pulse signal T, timing auxiliary pulse signal t
12.	Trigger coil (magnet)	
	1) Terminal voltage	: $6.0^{+0.5}_{-2.0}$ VDC
	2) Direct current resistance	: Approx. 20Ω (25°C)
13.	Connection Printer side	: Jumper wire
14.	Guaranteed operating temperature	: 0°C ~ 50°C
15.	Reliability (MCBF)	: 700,000 columns
16.	Overall dimensions	: 86mm(W) x 49.5mm(D) x 19mm(H)
17.	Weight	: Approx. 90g

Repair

Repairs of the Model-42III Micro Printer are grouped into two cleases (A and B) as defined in Paragraph 2.1 below, according to the difficulties involved. Be sure to have the printer repaired by those persons who are qualified at least for the corresponding repair class.

2.1 Repair Classification

Class A: General knowledge of the construction and operating principle of the printer, as well as basic repair technique is required. Neither special experience nor trained skill is required.

Class B: Advanced knowledge of the construction and operating principle of the printer is required.
Techniques for handling special tools, jigs and measuring instruments in disassembly and assembly as well as practical repair experience are required.

2.2 Repair Procedures

Should a trouble occur, refer to Paragraph 2.4 "Troubleshooting Table" to confirm the nature and condition of the trouble, determine the cause of trouble, then check the defective part and perform the suggested remedy. Troubleshooting Table is divided into the following five columns:

(1) NATURE OF TROUBLE: Find the nature of the trouble in this column.

(2) CONDITION OF TROUBLE: Compare the actual condition of the trouble with the description given in this column, then confirm whether or not they are identical.

(3) POSSIBLE CAUSE: Possible causes of the trouble are listed in this column for the respective trouble conditions. Determine the cause. The next column "REPAIR CLASSIFICATION" suggests you the level of repair skill required.

(4) CHECK POINT: Points of the mechanism most likely to cause the trouble are listed in this column.
Check each item according to the instruction in the column and locate the defective part.

(5) REMEDY: The remedy for the corresponding cause of trouble is suggested in this column. If the trouble persists after the implementation of the suggested remedy, check other items in "POSSIBLE CAUSE" column and perform the corresponding remedy.

When you desire to visually examine the condition of gear trains and the operation of parts operatively associated therewith, do it while manually turning the motor gear counterclockwise.

2.3 Terminal Contacts Arrangement

Connection	Terminal No.	The side of printer detector is designated as 1.
Trigger coil (−)	1	
Trigger coil (+)	2	
Motor (+)	3	
Motor (−)	4	M
Timing Pulse T	5	
Reset Pulse R	6	
Common line for detector C	7	
Timing Support t	8	
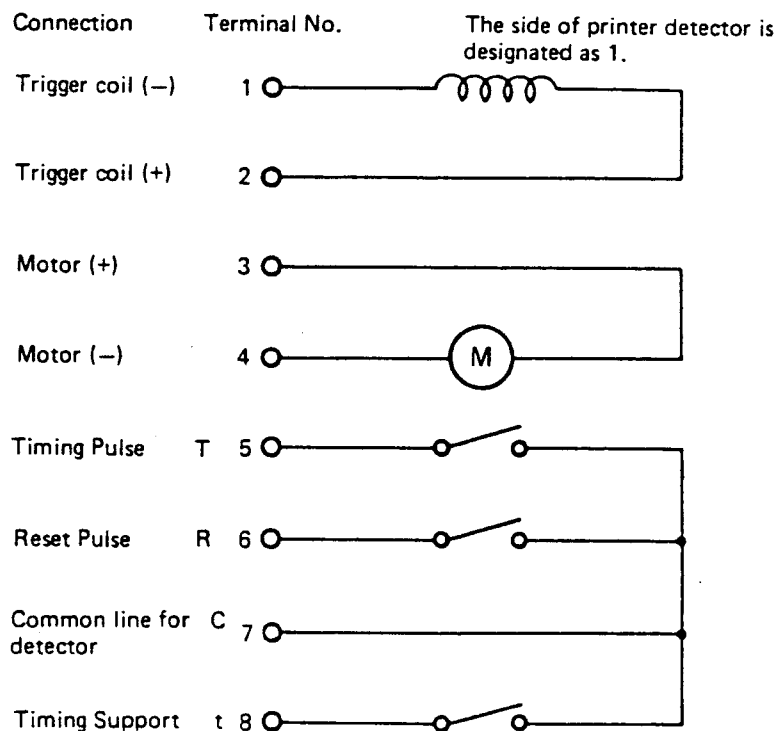
Fig. 29

2.4 Troubleshooting Table

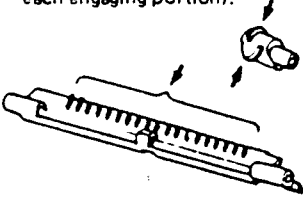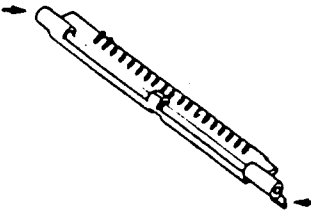| NATURE OF TROUBLE	CONDITION OF TROUBLE	POSSIBLE CAUSE	REPAIR CLASSI-FICATION	CHECK POINT	REMEDY
1. Motor does not run.	Turning power ON does not cause the motor to rotate or the rotation is locked.	1) Jumper wire C3 is not conducting.	A	• Verify electrical continuity across the motor power terminals according to Par. 2.3.	• Resolder the parts or replace the jumper wire C3.
		2) Improper power supply to motor A20 (power supply circuit)	—	• Check electrical continuity across the motor power terminals according to Par. 2.3 → Standard: Refer to 1.2-10.	• Repair the input power side.
		3) Rotating mechanism is clogged with foreign matters.	A	• Turn by hand the first reduction gear B15 counterclockwise and check if each mechanism operates properly.	• Remove the foreign matters.
		4) Hammer A6 and print wheel assy A7 are locked.	B	• Turn by hand the first reduction gear B15 counterclockwise and check if the print wheel assy and related mechanisms operate properly.	• Replace the hammer A6.
		5) Print changeover cam B7 is mounted improperly.	B	• Check it.	• Modify the mounting position.
		6) Failure of motor A20.	B	• When no troubles are found by checking the aforementioned Causes 1) to 5).	• Replace the motor A20.
2. No column can be printed.	Motor rotates normally, but no column can be printed.	1) Jumper wire C3 is not conducting.	A	• Check electrical continuity across the terminals of the detector assy C2 and trigger coil assy B13 according to Par. 2.3.	• Resolder the parts or replace jumper wire C3.
		2) Coil of the trigger coil assy B13 is broken.	B	• Measure the resistance value of the trigger coil assy B13 according to Par. 2.3. → Standard: Refer to Par. 1.2-12.	• Replace the trigger coil assy B13.
		3) Print changeover cam B7 is mounted improperly.	B	• Refer to Cause 5) of Nature of Trouble 1.	• Modify the mounting position.
		4) Breakage of the hammer spring of hammer transfer lever assy A5.	B	• Visually check after removing the ink roller assy from the carriage A4.	• Replace the hammer transfer lever assy A5.
		5) Faulty engagement of the print can A12 with the hammer transfer lever assy A5.	B	• Check.	• Modify the engagement. • When disengagement is likely to occur, bend the hammer spring of hammer transfer lever assy A5 to permit easy engagement.
		6) Heating elements are not energized (input pulse is not applied properly for the trigger coil assy B13)	B	• Check the circuit side to be sure that the input pulse is applied properly. → Standard: Refer to "Specifications".	• Modify the circuit side.

NATURE OF TROUBLE	CONDITION OF TROUBLE	POSSIBLE CAUSE	REPAIR CLASSI-FICATION	CHECK POINT	REMEDY
3. Printed characters are chipped.	Upper and lower, and right and left portions of the printed characters are chipped.	1) Platen assy A17 is mounted improperly.	A	● Check if the platen assy A17 is perly set to the frame.	● Modify the mounting position.
		2) Wear of print cam A12, hammer transfer lever assy A5 and hammer A6.	B	● Visually check the stroke of hammer A6 by putting the trigger lever B4 into sucking state by hand.	● Replace the worm parts.
		3) Wear of positioning plate A1 and sticking of foreign matters.	B	● Check the wear of the tooth of positioning plate A1 for advancing column as well as the sticking of foreign matters.	● Replace the positioning plate A1. ● Remove the foreign matters.
		4) Foreign matters sticking to the print wheel assy A7 and hammer A6.	A	● Visually check the hammer tip and the front and back surfaces of print wheel.	● Remove the foreign matters.
		5) Print wheel assy A7 is too weak, and characters are worm out.	B	● Visually check the frame of print wheel and the characters of the same.	● Replace the print wheel assy A7.
4. Omission of character.	Omission of character occurs in all columns.	1) Trigger lever spring B5 is mounted improperly.	A	● Check.	● Modify the mounting position.
5. Erroneous printing	Prints a character different from that to be printed.	2) Selecting ratchet spring A18 is too weak or disengaged.	A	● Visually check from the bottom of the printer.	● Replace the selecting ratchet spring A18.
		3) Hammer spring of the hammer transfer lever assy A5 is too weak.	B	● Visually check from the top of the printer.	● Replace the hammer transfer lever assy A5.
		4) Faulty operation of print wheel assy A7.	B	● Return the print wheel assy A7 and carriage A4 to the waiting position. Then, slide the carriage by hand after the positioning plate A1 is released, and check if the print wheel slides smoothly.	● Replace the print wheel assy A7.
		5) Improper adjustment of detection wheel C1.	B	● Check.	● Adjust the detection wheel C1.
		6) Bending of the brush of detector assy C2.	B	● Check the bending of the brush.	● Replace the detector assy C2.

NATURE OF TROUBLE	CONDITION OF TROUBLE	POSSIBLE CAUSE	REPAIR CLASSI-FICATION	CHECK POINT	REMEDY
4. Omission of character 5. Erroneous printing		7) Trigger plate B12 and trigger yoke of selecting gear assy B14 are clogged with foreign matters.	A	● Check if the foreign matters stick to them.	● Remove the foreign matters.
		8) Trigger plate B12 and trigger yoke of the selecting gear assy B14 are scratched or burred.	B	● Check if they are scratched or burred.	● Replace the trigger plate B12 and selecting gear assy B14.
		9) Carriage feeding gear A16 is mounted improperly.	B	● Check.	● Modify the mounting position.
		10) Maulty column advancing.	B	● Refer to Nature of Trouble 9.	
		11) Faulty returning.	B	● Refer to Nature of Trouble 10.	
6. Printed Characters are stained or indistinct.	Printed characters are stained or indistinct.	1) Ink roller assy is mounted impro-Perly.	A	● Check.	● Modify the mounting position.
		2) Use of improper ink roller assy.	A	● Check if the specified ink roller assy is used. → Standard: Refer to 1.2-9.	● Replace it with the specified ink roller assy.
		3) Ink roller spring A14 is too weak.	A	● Remove the ink roller assy and visually check.	● Replace the ink roller spring A14.
		4) Exhaust of ink for ink roller assy.	A	● Check the ink roller for remaining quantity of ink.	● Replace ink roller assy.
		5) Wear of print cam A12, hammer transfer lever assy A5 and hammer A6.	B	● Refer to Cause 2) of Nature of Trouble 3.	
		6) Print wheel assy A7 and platen assy A17 are clogged with foreign matters.	A	● Check if they are clogged with ink or paper particles.	● Remove the foreign matters.
		7) Bending of the paper guide ear portion of platen assy A17 (metal portion at the outlet).	A	● Visually check from the top of the printer.	● Modify the shape of ear portion or replace the platen assy A17.
7. Paper feeding is impossible.	Motor runs normally, but the paper cannot be fed.	1) Jumper wire C3 is not conducting.	A	● Refer to Cause 1) of Nature of Trouble 1.	
		2) Coil of the trigger coil assy B13 is broken.	B	● Refer to Cause 2) of Nature of Trouble 2.	
		3) Heating elements are not energized. (input pulse is not applied properly for the trigger coil assy B13).	—	● Refer to Cause 6) of Nature of Trouble 2.	

NATURE OF TROUBLE	CONDITION OF TROUBLE	POSSIBLE CAUSE	REPAIR CLASSI-FICATION	CHECK POINT	REMEDY
7. Paper feeding is impossible.		4) Paper guide of platen assy A17 is clogged with foreign matters.	A	● Check the travelling route of the paper guide.	● Remove the foreign matters.
		5) Scratch or-wear of paper feeding gear train.	B	● Put the trigger lever B4 into sucking state by hand, and visually check the gear train, while paper feeding operation is being performed. ● Paper feeding ratchet wheel A11. ● Paper feeding drive gear assy B1. ● Paper feeding transmission gear B2. ● Paper feeding gear. (inculded in the platen assy A17).	● Replace the faulty parts.
8. Paper feeding does not occur at specified pitch.	Characters are not printed at regular line pitch.	1) Use of improper paper.	A	● Check if the specified paper is used. → Standard: Refer to 1.2-7.	● Replace it with the specified paper.
		2) Platen assy A17 is mounted improperly.	A	● Refer to Cause 1) of Nature of Trouble 3.	
		3) Faulty platen assy A17.	B	● Check if the paper feeding rubber is worn out or it is slippery because of sticking of foreign matters.	● Roughen the surface of the paper feeding rubber using sand paper or replace the platen assy A17.
		4) Faulty paper feeding drive gear assy B1.	B	● Check if the inside spring is broken.	● Replace the paper feeding drive gear assy B1.
		5) Scratch or wear of paper feeding gear train.	B	● Refer to Cause 5) of Nature of Trouble 7.	
		6) Improper supply of paper.	A	● Check if the paper supply is performed properly.	● Modify the improper paper supply.
9. Improper column advancing.	Carriage A4 does not carry column.	1) Wear of trigger lever B4.	B	● Check the wear (at the portion where the lever is engaged with selecting ratchet B6).	● Replace the trigger lever B4.
		2) Wear of selecting ratchet B6.	B	● Check the wear.	● Replace the selecting ratchet B6.

NATURE OF TROUBLE	CONDITION OF TROUBLE	POSSIBLE CAUSE	REPAIR CLASSI-FICATION	CHECK POINT	REMEDY
9. Improper column advancing.		3) Wear or damage of print cam A12 and positioning plate A1.	B	● Check the wear or damage (at each engaging portion).	● Replace the print cam A12 and positioning plate A1.
		4) Heating elements are not energized (input pulse is not applied properly for the trigger coil assy B13).	–	● Check the circuit side to be sure that the input pulse is applied properly.	● Modify the circuit side.
		5) Faulty operation of positioning plate.	B	● Check the operation of positioning plate by hand after releasing it. 1 Positioning plate is too weak. 2 Foreign matters are sticking to the clearance of positioning shaft and positioning plate.	● Modify the positioning plate for the bending of its spring. ● Remove the foreign matters.
10. Improper return.	Carriage A4 does not return to its original position.	1) Wear of return lever B3.	B	● Check the wear.	● Replace the return lever B3.
		2) Return lever spring B16 is too weak.	A	● Visually check from the bottom of the printer.	● Replace the return lever spring B16.
		3) Carriage spring A13 and print wheel spring A10 are too weak.	B	● Visually check from the top of the printer.	● Replace the carriage spring A13. ● Replace the print wheel spring A10.
		4) Wear of contact point between the cam of positioning plate A1 and frame.	B	● Check the wear.	● Replace the positioning plate A1.
		5) Heating elements are not energized. (imput pulse is not applied properly for the trigger coil assy B13).	–	● Check the circuit side to be sure that the input pulse is applied properly.	● Modify the circuit side.
		6) Faulty operation of carriage A4.	A	● Check if the sliding portion between carriage A4 and the print wheel assy A7 is clogged with foreign matters.	● Clean it with O-3 (Lubricant).
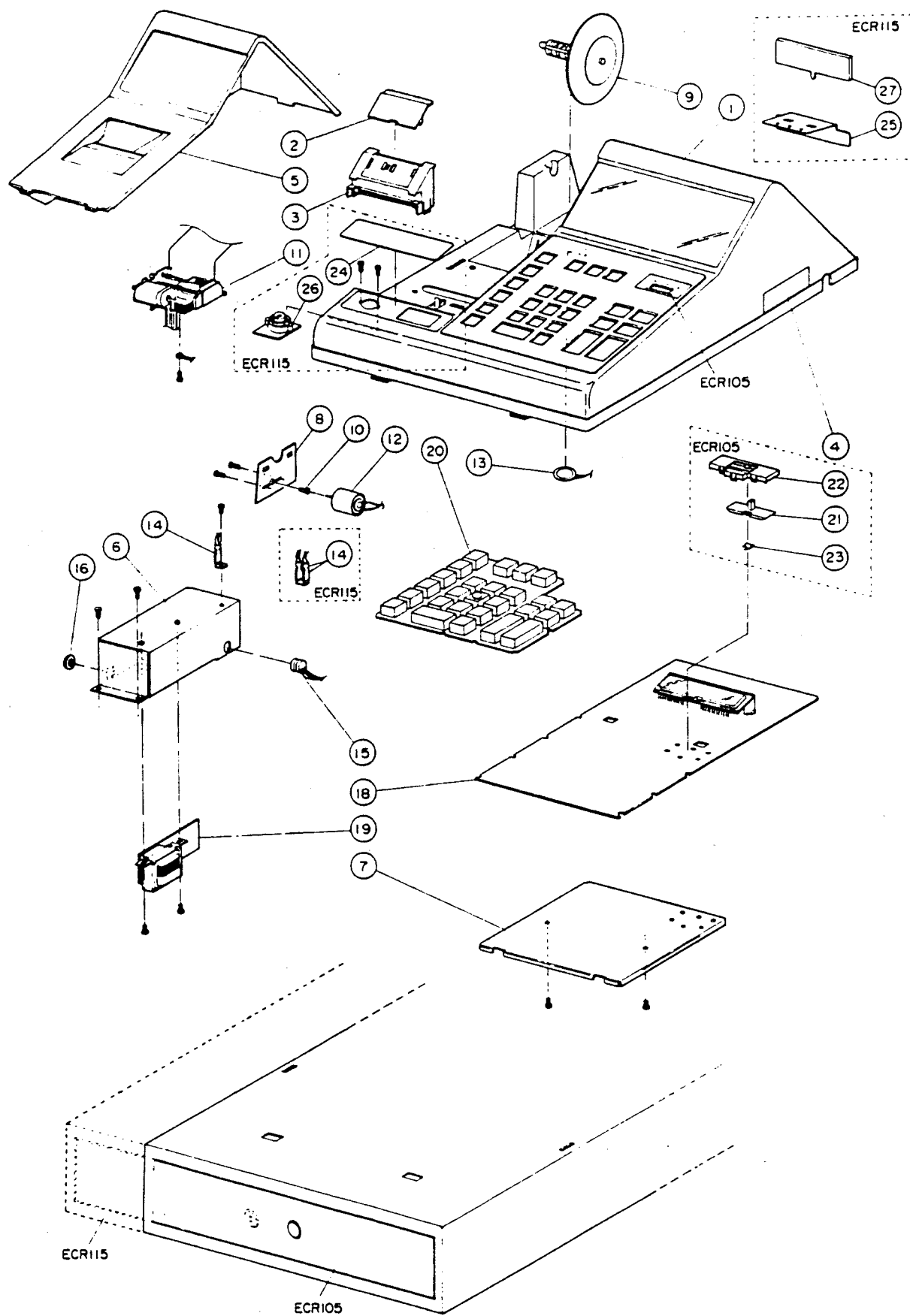
PRODUCT SAFETY NOTICE

Each precaution in this manual should be followed during servicing. Components identified with the IEC symbol △ in the parts list and the schematic diagram designate components in which safety can be of special significance. When replacing a component identified with △, use only the replacement parts designated, or parts with the same ratings of resistance, wattage or voltage that are designated in the parts list in this manual. Leakage-current or resistance measurements must be made to determine that exposed parts are acceptably insulated from the supply circuit before returning the product to the customer.

Ref.No.	PART No.	DESCRIPTION	Q'ty
		INDIVIDUAL	
	R-4079401	OUTER CARTON.ECR105	1
	R-4079402	OUTER CARTON.ECR115	1
	R-4178009	PAD.ECR105	1
	R-4178010	PAD.ECR105	1
	R-4178011	PAD.ECR115	1
	R-4178012	PAD.ECR115	1
	R-47700958	INSTRUCTION BOOK.USA, CANADA	1
	R-47700959	INSTRUCTION BOOK,ENGLISH } OR	1
	R-47700978	INSTRUCTION BOOK,GERMAN	1
	R-357620	POLYETHYLENE BAG.ECR105, UNIT	1
	R-357501A	POLYETHYLENE BAG.ECR115, UNIT	1
	R-357496A	POLYETHYLENE BAG.CORD	1
	R-357578	POLYETHYLENE BAG, INSTRUCTION BOOK	1
	R-357338	POLYETHYLENE BAG.ECR115, DRAWER KEY,MODE KEY	1
	R-4079400	ROLL PAPER	1
	R-47700753	PRINTING.USA	1
		CABINET	
1	R-A706973	CABINET ASS'Y.ECR105	1
1	R-A706974	CABINET ASS'Y.ECR115	1
2	R-3978466	BRACKET	1
3	R-3978467	BRACKET	1
4	R-47700961	RATING LABEL.W/O CANADA, ECR105	1
4	R-47700980	RATING LABEL.W/O CANADA, ECR115	1
14	R-47701237	RATING.LABEL.CANADA	1
	R-4779841A	LABEL.ATICONFORME, CLASSEB.FRANCE	1
5	R-A706976	PRINTER COVER ASS'Y, ECR105	1
5	R-A706977	PRINTER COVER ASS'Y, ECR115	1
	R-3670067-1	NAME PLATE.ECR115	1
		CHASSIS	
6	R-1277125	CHASSIS.POWER SOURCE	1
7	R-1277124	CHASSIS.KEYBOARD	1
8	R-1277144	BRACKET.MOTOR	1
9	R-3974552A	REEL	1
10	R-A703382	SPACER ASS'Y	1
	411 026 1504	SCR S-TPG PAN 2.6X6, CHASSIS-CABINET	2
	411 026 7704	SCR S-TPG PAN 3X6, PCB-CABINET	2
	411 040 0507	SCR PAN 2.6X3,MOTOR } OR	2
	411 002 7803	SCR PAN 3X4,MOTOR	2
	411 001 4407	SCR S-TPG PAN 3X6, CHASSIS.POWER	2
	411 008 0402	WASHER OUT TW 3, CHASSIS.POWER	2
	411 046 1003	SCR PAN-SW 4X6,PRINTER, EARTH	1
	411 001 4407	SCR S-TPG PAN 3X6, TERMINAL-CHASSIS	1
	411 046 1003	SCR PAN-SW 4X6, EARTH-CHASSIS.POWER	1

Ref No.	PART No.	DESCRIPTION	Q'ty
	411 004 4602	NUT HEX 4.EARTH-CHASSIS, POWER	1
	411 001 5800	SCR S-TPG PAN 4X6,POWER, TRANSFORMER	2
25	R-1277122	BRACKET.REAR DISPLAY, ECR115	1
	411 026 1504	SCR S-TPG PAN 2.6X6, MODE LOCK	2
		CHASSIS ELC.	
11	R-S874262	PRINTER	1
CS1	R-377176-8	HOUSING.8P,PRINTER	1
	R-257354	TERMINAL	8
CS101	R-S27440-1	SOCKET.8P.PRINTER	1
12	R-S57418	DC MOTOR.REWIND } OR	1
12	R-S57418-1	DC MOTOR.REWIND	1
CS2	R-S27298-2	HOUSING.2P.REWIND	1
	R-247755	TERMINAL	2
13	R-S07621-1	BUZZER.BZ1	1
CS6	R-377176-2	HOUSING.2P,BUZZER	1
	R-257354	TERMINAL.ECR105	2
	R-257354	TERMINAL.ECR115	5
26	R-S47994	KEY LOCK.MODE	1
	R-A79218	KEY.REG.X,Z.PS	(1)
△	R-S1758	TERMINAL.EARTH	1
	R-257354	TERMINAL.EARTH.ECR105	1
	R-S17388	TERMINAL.EARTH.ECR105	1
14	R-367306	INSULATOR.EARTH.ECR105	1
	R-S17387	TERMINAL.EARTH.ECR115	1
	R-S17388	TERMINAL.EARTH.ECR115	2
14	R-367306	INSULATOR.EARTH.ECR115	2
	R-4773896A	INDICATION LABEL, PRINTER.USA	1
△	R-S3747-1	AC CORD.2000MM.120V	1
△	R-S3740-2	AC CORD.2000MM.110V	1
△	R-S37341	AC CORD.2100MM.220V } OR	1
△	R-S37010B	AC CORD.2100MM. 220-240V	1
△	R-S37057B	AC CORD.2100MM.240V	1
15	R-377005	BUSHING } OR	1
15	△ R-377070	BUSHING.TAIWAN	1
	R-257312	TERMINAL.AC CORD	2
△	R-S1758	TERMINAL.AC CORD.W/O. TAIWAN	1
	R-167068A	CORE.AC CORD.W/O TAIWAN	1
16	R-447023	BUSHING	1
	R-S17399-3	WIRE BAND.ECR115	2
CS8	R-377176-13	HOUSING.13P.ECR115	1
CS7	R-377176-11	HOUSING.11P.ECR115	1
	R-257354	TERMINAL.CS7.8.ECR115	24
27	R-S67131	FLUORESCENT MULTI-TUBE, ECR115	1
		PC BOARD 1, ECR105	
18	R-A706480	PC BOARD ASS'Y.M1.USA	1
CP1	R-S27781-8	PLUG.8P.PRINTER	1
CP2	△ R-S27207-2	PLUG.2P.REWIND	1
CP3	△ R-S27207-3	PLUG.3P.DRAWER	1
CP4	R-S27703-2	PLUG.2P.POWER	1
CP6	R-S27781-2	PLUG.2P.BUZZER	1
	R-S67131-1	FLUORESCENT MULTI-TUBE, FRONT DISP	1
	R-1277123	BRACKET.FRONT DISP	1
X1	R-S17910	CERAMIC OSCILLATOR	1
X2	R-S17440-1	CRYSTAL OSCILLATOR	1

NOTES. 1. Part orders must contain Model Number, Part Number and Description.
2. Ordering quantity of screws and resistors must be multiple of 10 pcs.

PARTS LIST

Ref No	PART No	DESCRIPTION	Q'ty
T1	R-W770862	INVERTER TRANSFORMER	1
F1	△R-S17542-2	FUSE,2A 125V	1
	△R-S17024	FUSE HOLDER	2
	R-4773895A	INDICATION LABEL,USA	1
	R-4776798	CAUTION LABEL,USA	1
Z1	R-B1711A	BATTERY	1
IC1	409 052 3104	IC TC74HC132P	1
IC2	410 028 8207	IC UPD75208CW-111	1
IC3,4	409 074 0006	IC M5272L	2
Q1-3	405 019 1909	TR 2SC536-E-NP } OR	3
Q1-3	405 020 7402	TR 2SC945A-P	3
Q4	405 018 0101	TR 2SC3331-T	1
Q5	405 025 5205	TR 2SD863-E } OR	1
Q5	405 025 5403	TR 2SD863-F	1
D36-39, D41,42	407 005 1603	DIODE DS135D } OR	6
D36-39 D41,42	407 004 9105	DIODE DSF10C	6
D28-30, D32,40	407 013 7109	DIODE 1S2473 } OR	5
D28-30 D32,40	407 005 3805	DIODE DS442	5
D1-11, D22,24, D33-35, D31	407 013 6607	DIODE 1S2471C	17
D18	407 013 6607	DIODE 1S2471C	1
ZD1	407 050 7605	ZENER DIODE GZA9.1X	1
ZD2	407 050 3706	ZENER DIODE GZA4.7Y	1
ZD3,4	407 050 4901	ZENER DIODE GZA5.1Z	2
ZD5	407 049 9108	ZENER DIODE GZA2.7X	1
R40	401 027 1009	CARBON 5.6 JA 1/6W	1
R51,55	401 025 1308	CARBON 150 JA 1/6W	2
R49	401 026 9600	CARBON 470 JA 1/6W	1
R44, R46-48, R57,58	401 024 7004	CARBON 1K JA 1/6W	6
R50	401 024 9305	CARBON 1.2K JA 1/6W	1
R35	401 025 7805	CARBON 2.2K JA 1/6W	1
R56	401 026 4308	CARBON 3.3K JA 1/6W	1
R1-3,24, R26-28, R39,43	401 026 9907	CARBON 4.7K JA 1/6W	9
R8-19, R25,29, R30,32, R33,37, R42,45, R52,53	401 024 7400	CARBON 10K JA 1/6W	23
R36	401 025 1902	CARBON 15K JA 1/6W	1
R38	401 025 8208	CARBON 22K JA 1/6W	1
R4-7, R20-23	401 027 0309	CARBON 47K JA 1/6W	8
R31	401 027 5908	CARBON 68K JA 1/6W	1
R54	401 024 7707	CARBON 100K JA 1/6W	1
R34	401 026 4902	CARBON 330K JA 1/6W	1
C4	403 121 2104	ELECT 22U M 10V	1
C12	403 134 5208	ELECT 22U M 25V	1
C29	403 107 9905	ELECT 10U M 16V	1
C21	403 121 2302	ELECT 470U M 10V	1
C25	403 121 2807	ELECT 6800U M 16V	1
C22	403 121 3101	ELECT 10U M 35V	1
C14,17	403 109 6308	ELECT 1U M 50V	2
C28	403 121 3408	ELECT 2.2U M 50V	1
C5	403 121 2906	ELECT 3.3U M 25V	1
C19	403 121 3507	ELECT 4.7U M 50V	1
C9	403 017 9309	CERAMIC 22P J 50V	1
C6,7	403 022 1602	CERAMIC 30P J 50V	2
C10	403 022 7505	CERAMIC 33P J 50V	1
C8,11	403 072 8101	CERAMIC 330P K 50V	2
C1-3,18	403 105 1000	CERAMIC 0.01U Z 50V	4
C20	403 059 4409	POLYESTER 2200P M 50V	1
C23	403 061 2905	POLYESTER 3900P M 50V	1
C24	403 074 3005	CERAMIC 0.047U Z 50V	1
C13,16	403 001 3009	CERAMIC 0.1U M 16V	2
SW1	R-S47909	SLIDE SWITCH	1
18	R-A706985	PC BOARD ASS'Y,M1,CANADA	1
	R-4776476	PARTS NAME LABEL,BATTERY	1

Ref No.	PART No	DESCRIPTION	Q'ty
D18	407 013 6607	DIODE 1S2471C	1
18	R-A706986	PC BOARD ASS'Y,M1,PANAMA, SNGPOR,W GER,PHILPN,U K, FRANCE,S AFR,AUS	1
D18,23	407 013 6607	DIODE 1S2471C	2
18	R-A706987	PC BOARD ASS'Y,M1,TAIWAN, SPAIN,INDNSIA	1
D23,26	407 013 6607	DIODE 1S2471C	2
18	R-A706988	PC BOARD ASS'Y,M1,SWISS	1
D15,18, D23	407 013 6607	DIODE 1S2471C	3
18	R-A706989	PC BOARD ASS'Y,M1,EGYPT, MUSCAT	1
D13,23	407 013 6607	DIODE 1S2471C	2

PC BOARD 1, ECR115

Ref No.	PART No	DESCRIPTION	Q'ty
18	R-A706479	PC BOARD ASS'Y,M1,USA	1
CP1	R-S27781-8	PLUG,8P,PRINTER	1
CP2	△R-S27207-2	PLUG,2P,REWIND	1
CP3	△R-S27207-3	PLUG,3P,DRAWER	1
CP4	R-S27703-2	PLUG,2P,POWER	1
CP6	R-S27781-2	PLUG,2P,BUZZER	1
CP5	R-S27781-5	PLUG,5P,MODE	1
CP8	R-S27781-13	PLUG,13P,REAR DISPLAY	1
CP7	R-S27781-11	PLUG,11P,REAR DISPLAY	1
	R-S67131-1	FLUORESCENT MULTI-TUBE, FRONT DISP	1
	R-1277123	BRACKET,FRONT DISP	1
X1	R-S17910	CERAMIC OSCILLATOR	1
X2	R-S17440-1	CRYSTAL OSCILLATOR	1
T1	R-W770862	INVERTER TRANSFORMER	1
F1	△R-S17542-2	FUSE,2A 125V	1
	△R-S17024	FUSE HOLDER	2
	R-4773895A	INDICATION LABEL,USA	1
	R-4776798	CAUTION LABEL,USA	1
Z1	R-B1711A	BATTERY	1
IC1	409 052 3104	IC TC74HC132P	1
IC2	410 028 8207	IC UPD75208CW-111	1
IC3,4	409 074 0006	IC M5272L	2
Q1-3	405 019 1909	TR 2SC536-E-NP } OR	3
Q1-3	405 020 7402	TR 2SC945A-P	3
Q4	405 018 0101	TR 2SC3331-T	1
Q5	405 025 5205	TR 2SD863-E } OR	1
Q5	405 025 5403	TR 2SD863-F	1
D36-39, D41,42	407 005 1603	DIODE DS135D } OR	6
D36-39 D41,42	407 004 9105	DIODE DSF10C	6
D28-30, D32,40	407 013 7109	DIODE 1S2473 } OR	5
D28-30 D32,40	407 005 3805	DIODE DS442	5
D1-3,5, D9-12, D19,20, D22,24, D27,31, D33-35	407 013 6607	DIODE 1S2471C	17
D18	407 013 6607	DIODE 1S2471C	1
ZD1	407 050 7605	ZENER DIODE GZA9.1X	1
ZD2	407 050 3706	ZENER DIODE GZA4.7Y	1
ZD3,4	407 050 4901	ZENER DIODE GZA5.1Z	2
ZD5	407 049 9108	ZENER DIODE GZA2.7X	1
R40	401 027 1009	CARBON 5.6 JA 1/6W	1
R51,55	401 025 1308	CARBON 150 JA 1/6W	2
R49	401 026 9600	CARBON 470 JA 1/6W	1
R44, R46-48, R57,58	401 024 7004	CARBON 1K JA 1/6W	6
R50	401 024 9305	CARBON 1.2K JA 1/6W	1
R35	401 025 7805	CARBON 2.2K JA 1/6W	1
R56	401 026 4308	CARBON 3.3K JA 1/6W	1
R1-3,24, R26-28, R39,43	401 026 9907	CARBON 4.7K JA 1/6W	9

NOTES: 1. Part orders must contain Model Number, Part Number and Description.
2. Ordering quantity of screws and resistors must be multiple of 10 pcs.

PARTS LIST

Ref No	PART No	DESCRIPTION	Q'ty
R8-19, R25,29, R30,32, R33,37, R42,45, R52,53	401 024 7400	CARBON 10K JA 1/6W	23
R48	401 006 9903	CARBON 100 JA 1/2W	1
R36	401 025 1902	CARBON 15K JA 1/6W	1
R38	401 025 8208	CARBON 22K JA 1/6W	1
R4-7, R20-23	401 027 0309	CARBON 47K JA 1/6W	8
R31	401 027 5908	CARBON 68K JA 1/6W	1
R54	401 024 7707	CARBON 100K JA 1/6W	1
R34	401 026 4902	CARBON 330K JA 1/6W	1
C4	403 121 2104	ELECT 22U M 10V	1
C12	403 134 5208	ELECT 22U M 25V	1
C29	403 107 9905	ELECT 10U M 16V	1
C21	403 121 2302	ELECT 470U M 10V	1
C25	403 121 2807	ELECT 6800U M 16V	1
C22	403 121 3101	ELECT 10U M 35V	1
C14,17	403 109 6308	ELECT 1U M 50V	2
C28	403 121 3408	ELECT 2.2U M 50V	1
C5	403 121 2906	ELECT 3.3U M 25V	1
C19	403 121 3507	ELECT 4.7U M 50V	1
C9	403 019 9309	CERAMIC 22P J 50V	1
C6,7	403 022 1602	CERAMIC 30P J 50V	2
C10	403 022 7505	CERAMIC 33P J 50V	1
C8,11	403 072 8101	CERAMIC 330P K 50V	2
C1-3,18	403 105 1000	CERAMIC 0.01U Z 50V	4
C20	403 059 4409	POLYESTER 2200P M 50V	1
C23	403 061 2905	POLYESTER 3900P M 50V	1
C24	403 074 3005	CERAMIC 0.047U Z 50V	1
C13,16	403 001 3009	CERAMIC 0.1U M 16V	2
SW1	R-S47909	SLIDE SWITCH	1
18	R-A706991	PC BOARD ASS'Y,M1,CANADA	1
	R-4776476	PARTS NAME LABEL,BATTERY	1
D18	407 013 6607	DIODE 1S2471C	1
18	R-A706992	PC BOARD ASS'Y,M1,PANAMA, SNGPOR,W.GER,PHILPN,U.K. FRANCE,S.AFR,AUS	1
D18,23	407 013 6607	DIODE 1S2471C	2
18	R-A706993	PC BOARD ASS'Y,M1,TAIWAN, SPAIN,INDNSIA	1
D23,26	407 013 6607	DIODE 1S2471C	2
18	R-A706994	PC BOARD ASS'Y,M1,SWISS	1
D15,18, D23	407 013 6607	DIODE 1S2471C	3
18	R-A706995	PC BOARD ASS'Y,M1,LIBYA, MUSCAT	1
D13,23	407 013 6607	DIODE 1S2471C	2

Ref No	PART No	DESCRIPTION	Q'ty
		PC BOARD 2	
19	R-A706674	PC BOARD ASS'Y,POWER,120V	1
	R-W770861	POWER TRANSFORMER	1
	R-S17306-9	FUSE,800MA 125V	1
	R-237030	FUSE HOLDER	2
	R-47700937	PARTS NAME LABEL	1
	404 026 9106	CERAMIC 4700P M	1
	R-W6722	CHOKE COIL	2
	R-377153-2	HOUSING,2P	1
	R-257318	TERMINAL	2
19	R-A706939	PC BOARD ASS'Y,POWER,110V	1
	R-W770861	POWER TRANSFORMER	1
	R-S17042	FUSE,1A AC125V	1
	R-237030	FUSE HOLDER	2
	R-4771849	PARTS NAME LABEL	1
	404 026 9106	CERAMIC 4700P M	1
	R-W6722	CHOKE COIL	2
	R-377153-2	HOUSING,2P	1
	R-257318	TERMINAL	2
19	R-A706940	PC BOARD ASS'Y,POWER,220V	1
	R-W770861-1	POWER TRANSFORMER	1
	R-S17445	FUSE,250V 250MA	1
	R-S17024	FUSE HOLDER	2
	R-47700938	PARTS NAME LABEL	1
	404 028 3201	MT-POLYEST 0.047U M 250V	1
	R-W6722	CHOKE COIL	2
	R-377153-2	HOUSING,2P	1
	R-257318	TERMINAL	2
19	R-A706941	PC BOARD ASS'Y,POWER 220-240V,240V	1
	R-W770861-1	POWER TRANSFORMER	1
	R-S17445	FUSE,250V 250MA	1
	R-S17024	FUSE HOLDER	2
	R-47700938	PARTS NAME LABEL	1
	404 028 3201	MT-POLYEST 0.0470 M 250V	1
	R-W6722	CHOKE COIL	2
	R-377153-2	HOUSING,2P	1
	R-257318	TERMINAL	2
		KEY BOARD	
20	R-4471423	RUBBER SHEET,USA,CANADA	1
20	R-4471423-3	RUBBER SHEET,FRANCE	1
20	R-4471423-2	RUBBER SHEET	1
21	R-3978468	KNOB,ECR105,ECR105	1
22	R-3978469	BRACKET,ECR105	1
23	R-1274902	PLATE SPRING,ECR105	1

NOTES: 1. Part orders must contain Model Number, Part Number and Description.
2. Ordering quantity of screws and resistors must be multiple of 10 pcs.
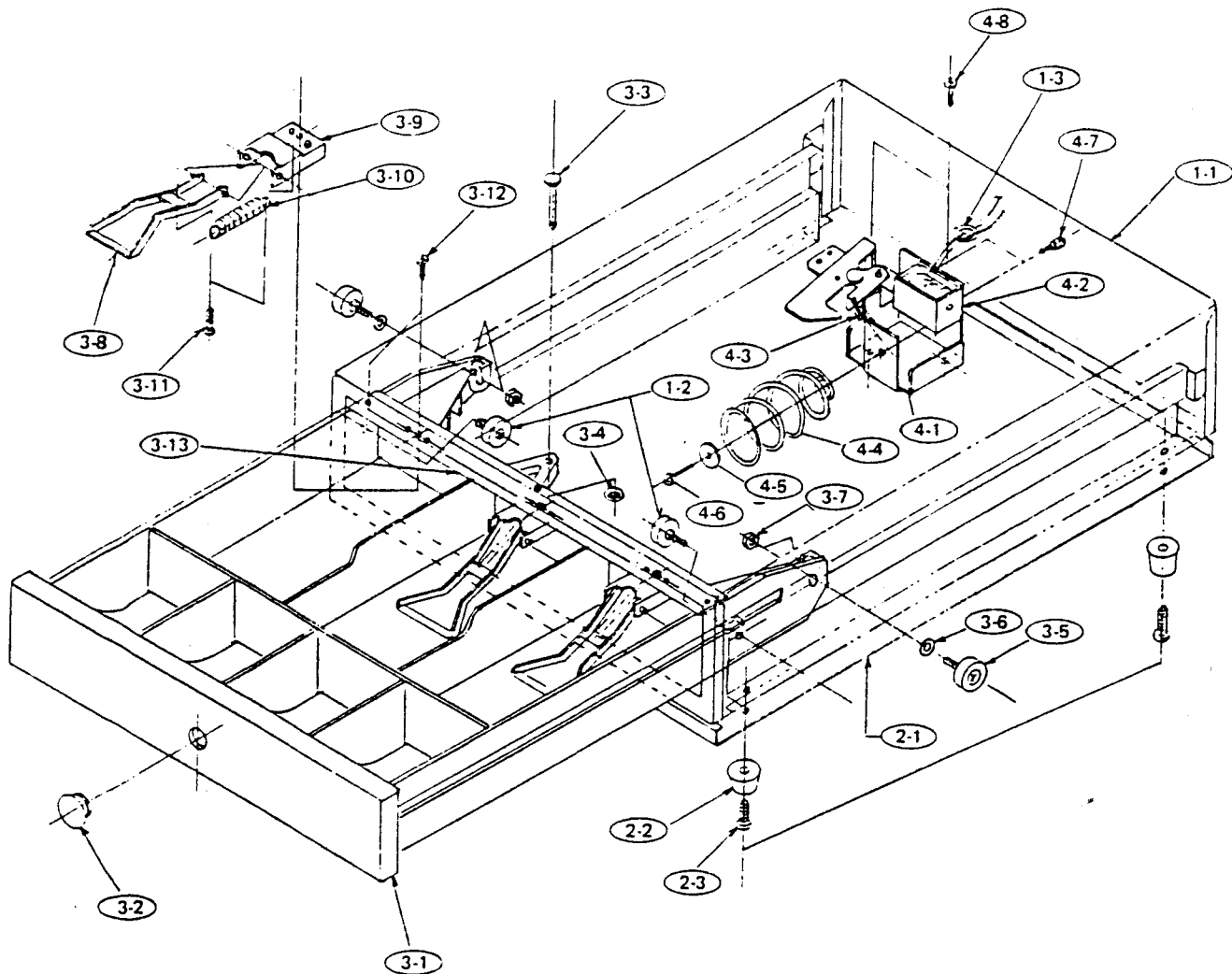
DRAWER PARTS LIST (4/4, 3/4) (ECR105)

Key No.	Parts No.	Description	Q'ty
1—1	TS-N1110-00	Cover sab ass'y	1
1—2	P-5041-2	Bearing	2
1—3	P-0046	Grommet	1
2—1	TS-N1201-01	Base	1
2—2	L-1020	Foots Rubber	4
2—3	P-0011-1	Slotted Head Tapping Screw	4
	CS-1300-00	TILL Ass'y, 4/4	1
	CS-1300-01	TILL Ass'y, 3/4	
3—1	CS-1301-00	TILL, 4/4	(1)
	CS-1301-01	TILL, 3/4	
3—2	CS-1302-00	Cape	(1)
3—3	N-1032	Hanger Shaft	(1)
3—4	P-0044	CS Stop Ring	(1)
3—5	P-5041	Bearing (B)	(2)
3—6	P-0035	Flat Washer	(2)
3—7	P-0022	Nut (M6)	(2)
3—8	L-1010	Holder, Paper Currency	(3,4)
3—9	L-1011		
3—10	L-1012	Holder Spring (B)	(3,4)
3—11	P-0017	Holder plux	(6,8)
3—12	P-00142	Plux	(6,7)
3—13	L-1009	Clip Holder	(1)

Key No.	Parts No.	Description	Q'ty
4—1	LK-1410-00	Planger Base Sab Ass'y	1
4—2	TOS-08A	Solenoid, 5V 4,5Ω	1
4—3	N-1025-1	Planger Spring (C)	1
4—4	N-1012-2	Drawer Spring	1
4—5	P-0036	Plain Washer	1
4—6	P-0016F	FT Screw	1
4—7	P-0003	SEMS Screw	2
4—8	P-0018-1	"S" Type Screw M3x6	2
	R-377176-3	Housing, 3P	1
	R-257354	Terminal, Housing	3
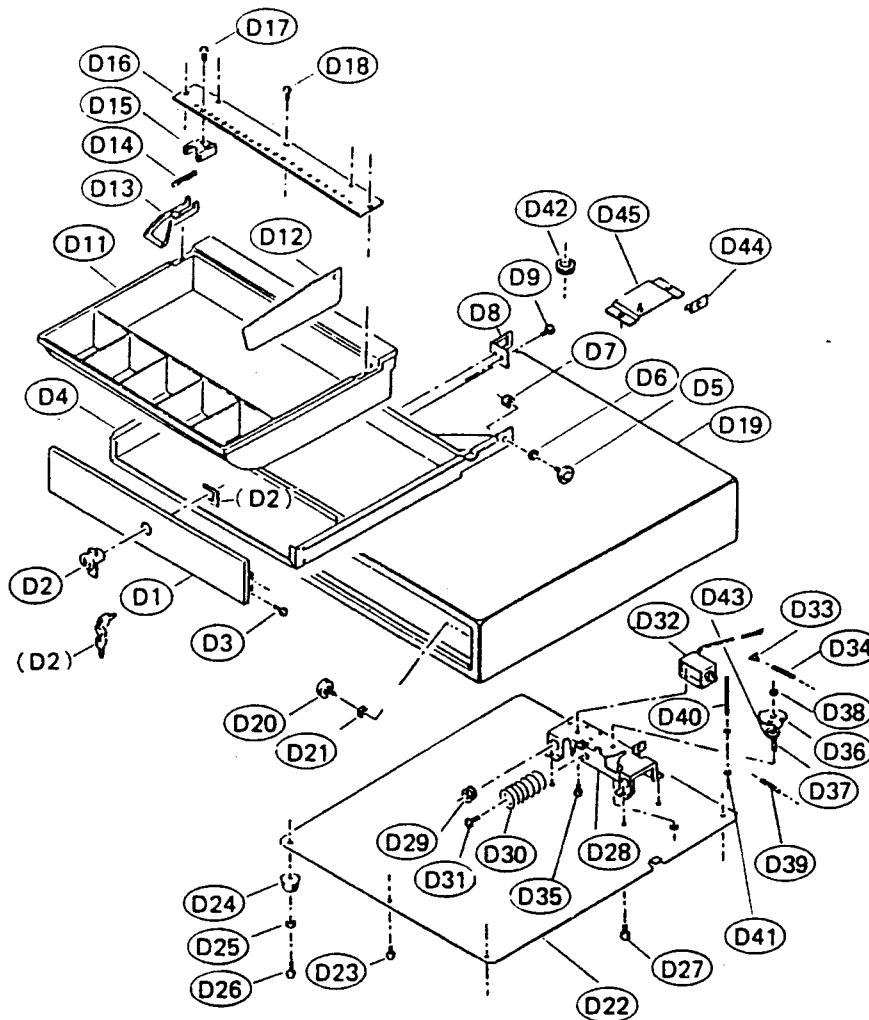
DRAWER PARTS LIST (5/5, 4/5) (ECR115)

Key No.	Parts No.	Description	Q'ty
	7257367N10200	Coin box assembly	1
D1	7252469N10407	Plate, Front	(1)
D2	7250260N10300	Lock assembly, W/key	(1)
	7107125N10002	Keys (Tow)	(1)
D3	411 001 4407	SCR S-TPG PAN 3 x 6	(4)
D4	7250367N10200	Coin box	(1)
D5	7252737N10000	Roller, Shaft	(2)
D6	411 008 2406	WASHER SPR 6	(2)
D7	411 004 5005	Nut, Hex, 6	(2)
D8	7252149N10200	Plate, Operation	(1)
D9	411 001 5800	SCR S-TPG PAN 4 x 6	(2)
	7257736N10200	Till assembly, Coin, 5/5	1
	7257736N10300	Till assembly, Coin, 4/5	
D11	7252736N10100	Case, Coin	(1)
D12	7252165N10275	Plate, Separation	(4,3)
D13	7252735N10100	Metal, Pressure	(5,4)
D14	7102018N27700	Spring	(5,4)
D15	7252171N10175	Metal, Holder	(5,4)
D16	7252318N10575	Plate	(1)
D17	411 026 2501	SCR S-TPG PAN 3 x 10	(5,4)
D18	411 026 2501	SCR S-TPG PAN 3 x 10	(5)
D19	7250143N11301	Coin case	1
D20	7252737N1000	Roller, Shaft	2
D21	411 008 2406	WASHER SPR 6	2
D22	7252242N10208	Cover, Bottom	1
D23	411 064 5502	SCR TPG B/N 3 x 6	2
D24	7102057N12000	Foot, Rubber	4
D25	411 008 4509	WASHER FLAT 4	4
D26	411 064 9906	SCR TPG B/N 4 x 12	4

Key No.	Parts No.	Description	Q'ty
D27	411 006 3207	SCR TPG B/N 4 x 8	4
D28	7252318N10375	Bracket	1
D29	0004034N10800	Bush	1
D30	7102018N25775	Spring	1
D31	411 029 4007	SCR PAN+FLG 4 x 10	1
D32	0004195N10900	Solenoid	1
D33	7252829N10000	Bracket	1
D34	7102018N24400	Spring	1
D35	411 003 8908	SCR PAN+FLG 3 x 6	2
D36	7252046N10100	Cam	1
D37	7252538N10300	Shaft, Lever	1
D38	411 016 3808	RING E5	1
D39	7102018N24300	Spring	1
D40	7252148N10100	Shaft, Operation plate	1
D41	411 016 1200	RING E3	2
D42	0004034N10800	Lead wire assembly	1
D43	411 088 3508	Washer V 6 x 13 x 1	1
D44	7252134N10100	Bracket	2
D45	7250285N10000	Bracket	1
	R-377176-3	Housing, 3p	1
	R-257354	Terminal, Housing	3
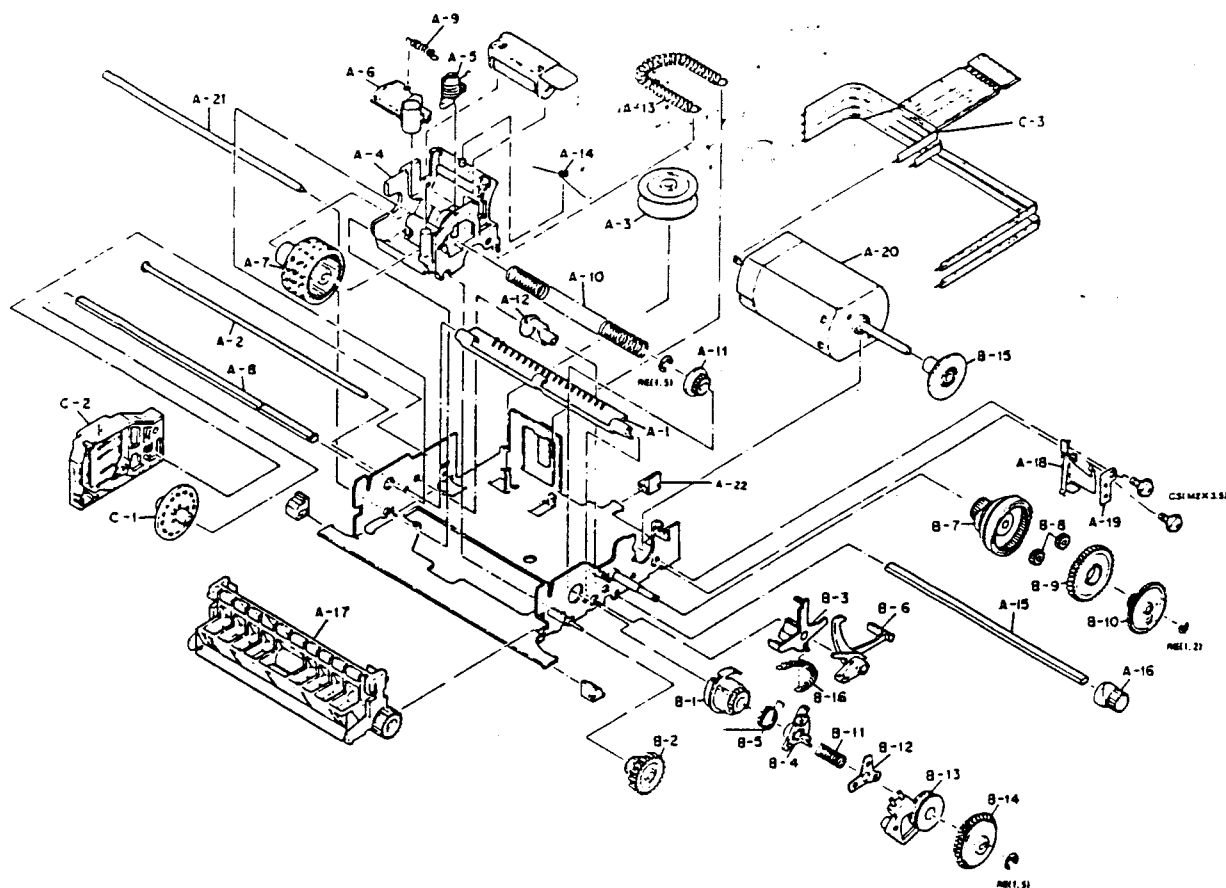
PRINTER MECHANISM PARTS LIST

Ref. No.	Parts No.	Description	Q'ty
A- 1	F808205010	POSITIONING PLATE	1
A- 2	F806206010	POSITIONING SHAFT	1
A- 3	F801205010	SPRING GUIDE ROLLER	1
A- 4	F808201010	CARRIAGE	1
A- 5	F802207000	HAMMER TRANSMISSION LEVER ASS'Y	1
A- 6	F809201020	HAMMER	1
A- 7	M817001090	PRINT WHEEL ASS'Y	1
A- 8	F808202010	PRINT WHEEL SHAFT	1
A- 9	F808201020	HAMMER RETURN SPRING	1
A-10	F801202020	PRINT WHEEL SPRING	1
A-11	F801202030	PAPER FEEDING RATCHET WHEEL	1
A-12	F801201040	PRINT CAM	1
A-13	F803201030	CARRIAGE SPRING	1
A-14	F806201020	INK ROLLER SPRING	1
A-15	F806207010	PLATEN SHAFT	1
A-16	F801211020	CARRIAGE FEEDING GEAR	1
A-17	F806251000	PLATEN ASS'Y	1
A-18	F801205030	SELECTING RATCHET SPRING	1
A-19	F801205140	SELECTING RATCHET SPRING HOLDER	1
A-20	F808051010	MOTOR	1
A-21	F803002010	GUIDE SHAFT	3
A-22	F801001050	RUBBER FITTING	2
CS	B040351111	CUP SCREW, 2 x 3.5	1
RE	B150300311	E-RING, 1.5	1

Ref. No.	Parts No.	Description	Q'ty
B- 1	F808101000	PAPER FEEDING DRIVE GEAR ASS'Y	1
B- 2	F801205080	PAPER FEEDING TRANSMISSION GEAR	1
B- 3	F808205020	RETURN LEVER	1
B- 4	F801205060	TRIGGER LEVER	1
B- 5	F803204020	TRIGGER LEVER SPRING	1
B- 6	F804204010	SELECTING RATCHET	1
B- 7	F803202010	PRINT CHANGE OVER CAM	1
B- 8	F801206020	PLANET GEAR	2
B- 9	F801206030	SELECTING DRIVE GEAR	1
B-10	F808204010	REDUCTION GEAR	1
B-11	F801205110	TRIGGER PLATE SPRING	1
B-12	F801205100	TRIGGER PLATE	1
B-13	F801205090	TRIGGER COIL	1
B-14	F803203000	SELECTING GEAR ASS'Y	1
B-15	F808051020	MOTOR GEAR	1
B-16	F806206030	HAMMER RETURN SPRING	1
RE	B150300311	E-RING, 1.5	1
RE	B150300212	E-RING, 1.2	1
C-1	F808152010	DETECTION WHEEL	1
C-2	F808151000	DETECTION ASS'Y	1
C-3	F801601010	JUMPER WIRE	1

Correction Notice

Please add this notice to the Service Manuals listed below.

Category : <u>ELECTRONIC CASH REGISTER</u>	Date : <u>Dec. 21, '90</u>
Model : <u>ECR105/115</u>	
Destination : <u>ALL AREA</u> REF : <u>WM-19840</u>	Issue Number : <u>3</u>

The following items were misprinted. Please make the necessary revisions as indicated in the Service Manuals listed above.

◇◇◇◇◇ IMPORTANT NOTICE ◇◇◇◇◇

When a RAM chip (including LSI with built-in RAM) is replaced or added, the battery switch must be in the "OFF" position. If not, it is possible that it will cause the hardware problems.

After a RAM chip (including LSI with built-in RAM) is replaced or added, the memory circuit must be reset by performing the following steps.

Step-1 : UNPLUG THE MACHINE.
Step-2 : TURN THE BATTERY SWITCH TO THE "OFF" POSITION.
Step-3 : MAKE A SHORT BETWEEN Vcm AND Ground WITH A PAIR OF TWEEZERS FOR 10 SECONDS.
Step-4 : PLUG THE MACHINE INTO THE AC-OUTLET.
Step-5 : TURN THE BATTERY SWITCH TO THE "ON" POSITION.

There may be other reset procedures available for the particular ECR. They will be described in the service manuals.

Please consult the service manuals before performing the above reset.

SANYO

SERVICE MANUAL Supplement
Electronic Cash Register

ECR115
(GENERAL(220V))
1 945 066 21

This service manual is prepared for ECR115(GENERAL(220V)). As only the components in the chart below differ, refer to the Service Manual ECR105/115 with WM-19840 for other components. But ECR105/115 includes many versions. So please refer to Singapore version.

PARTS LIST

No.	Section	Ref. No.	Description	ECR115 (SINGAPORE)	ECR115 (GENERAL(220V))	Remarks
1	INDIVIDUAL		ROLL PAPER	R-4079400	632 514 4399	
2	CABINET	4	RATING LABEL	R-47700980	632 502 6299	
3	CHASSIS		WIRE FIXTURE, POWER CHASSIS-DRAWER	(None)	632 250 0167	
4	CHASSIS ELC.	CS101	SOCKET, 8P, PRINTER	R-S27440-1	632 254 1481	
5		13	PIEZO BUZZER, 7NB-31R2-1R5, BZ1	R-S07621-1	420 000 5605	
6			K E Y. REG. X, Z, PS	R-A79218	632 245 1650	(1)-(2)
7			TERMINAL, HOUSING	(None)	632 287 6163	2 pcs.
8		CS5	HOUSING, 5P, MODE	(None)	632 301 1754	
9	PC BOARD 1		CAUTION LABEL, FUSE LABEL	(None)	632 350 4546	
10		Z1	BATTERY	R-81711A	632 246 0621	
11		IC1	IC, TC74HC132AP	409 052 3104	409 186 3001	
12		D36-39, 41,42	DIODE, DS1350-AT1 or DIODE, DSF10TC-AT1	407 005 1603 407 004 9105	407 005 1603 407 004 9600	6 pcs.
13		R48	CARBON, 100 JA 1/2W	401 024 7004	401 006 9903	
14		R57	CARBON, 2.2K JA 1/6W	401 024 7004	401 025 7805	
15	PC BOARD 2		INSULATOR, TRANS	(None)	632 524 2149	
16	DRAWER		HOUSING, 3P	R-377176-3	632 251 9428	
17			TERMINAL, HOUSING	R-257354	632 287 0857	3-2
9	OPTION		COVER, WATER PROOF	(None)	632 505 6906	

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SANYO

SERVICE MANUAL Supplement
Electronic Cash Register ECR115

|	
BORNEO	1 945 066 22
POLAND	1 945 066 29

This service manual is prepared for ECR115 Borneo and Poland. As only the components in the chart below differ, refer to the Service Manual ECR105/115 with WM-19840 for other components. But ECR105/115 includes many versions. So please refer to ECR115 Singapore and Spain versions.

PARTS LIST

No.	Section	Ref. No.	Description	ECR115 (SINGAPORE) / ECR115 (SPAIN)	ECR115 (BORNEO) / ECR115 (POLAND)	Remarks
1	INDIVIDUAL		POLYETHYLENE BAG. L280×410, INSTRUCTION BOOK	R-357578	632 607 4862	
2			POLYETHYLENE BAG. L90×170, DRAWER KEY, MODE KEY	R-357338	632 607 4763	
3			ROLL PAPER	R-4079400	632 514 4399	
4	CABINET	4	RATING LABEL	R-47700980	632 502 6299	
5	CHASSIS		WIRE FIXTURE, POWER CHASSIS-DRAWER	(None)	632 250 0167	
6	CHASSIS ELC.	CS101	SOCKET. 8P. PRINTER	R-S27440-1	632 254 1481	
7		13	PIEZO BUZZER. 7NB-31R2-1R5, BZ1	R-S07621-1	420 000 5605	
8			TERMINAL, HOUSING	(None)	632 287 6163	2PCS.
9		CS5	HOUSING. 5P. MODE	(None)	632 301 1754	
10			KEY. REG. X. Z. PS	R-A79218	632 245 1650	1)→2)
11			TERMINAL, EARTH.	(None)	632 250 5872	
12	PC BOARD 1		CAUTION LABEL, FUSE	(None)	632 350 4546	
13		Z1	BATTERY	R-B1711A	632 246 0621	
14		IC1	IC. TC74HC132AP	409 052 3104	409 186 3001	
15		D36-39, 41, 42	DIODE. DS135D-AT1 or DIODE. DSF10TC-AT1	407 005 1603 / 407 004 9105	407 005 1603 / 407 004 9600	6PCS.
16		R48	CARBON. 100JA 1/2W	401 024 7004	401 006 9903	
17		R57	CARBON. 2.2K JA 1/6W	401 024 7004	401 025 7805	
18	PC BOARD 2	19	PW BOARD ASS'Y. POWER. BORNEO	R-A706940	632 608 0665	
19			INSULATOR, TRANS	(None)	632 524 2149	
20	OPTION		COVER. WATER PROOF	(None)	632 505 6906	

DRAWER EXPLODED VIEW (4/8 for Poland)
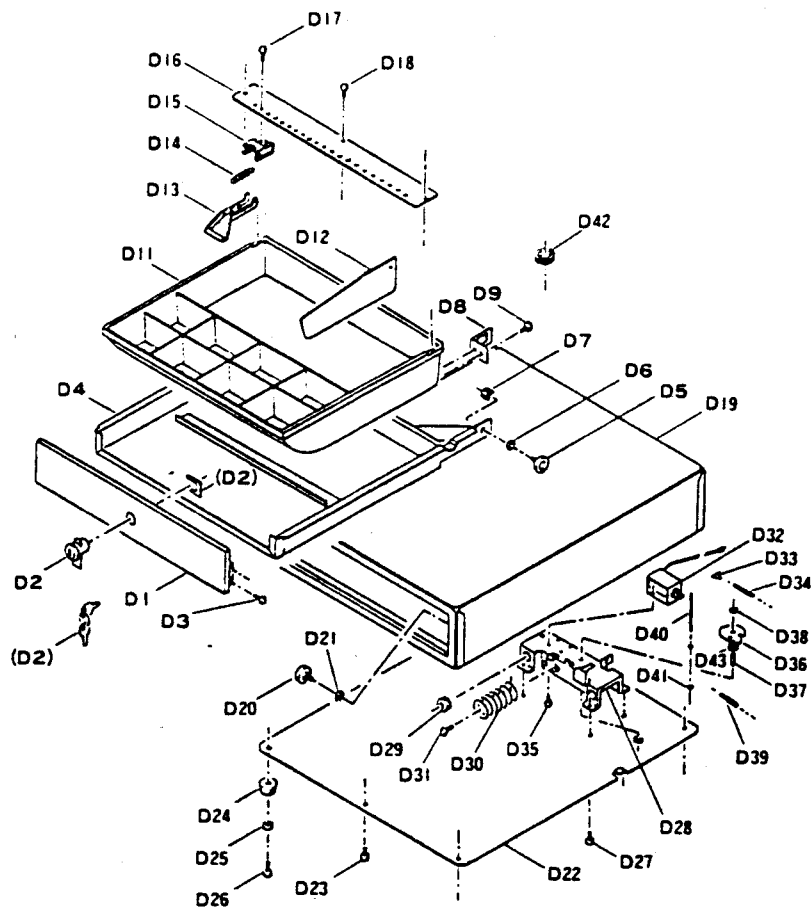
DRAWER PARTS LIST (4/8 for Poland)

Key No.	SANYO Code	Description	Q'ty
	632 161 0331	Coin box assembly	1
D 1	632 504 0202	Plate, Front	(1)
D 2	632 521 4016	Lock assembly, W/Key	(1)
	632 123 1260	Key (Tow)	(1)
D 3	411 001 4407	SCR S-TPG PAN 3×6	(4)
D 4	632 524 0848	Coin box	(1)
D 5	632 160 9021	Roller, Shaft	(2)
D 6	411 008 2406	WASHER SPR 6	(2)
D 7	411 004 5005	NUT HEX 6	(2)
D 8	632 160 7492	PLATE, Operation	(1)
D 9	411 001 5800	SCR S-TPG PAN 4×6	(2)
	632 161 0430	Till assembly, Coin, 4/8	1
D 11	632 160 9014	Case, Coin	(1)
D 12	632 160 7546	Plate, Separation	(4)
D 13	632 511 3692	Metal, Pressure	(5)
D 14	632 115 4453	Spring	(5)
D 15	632 160 7584	Metal, Holder	(5)
D 16	632 511 3739	Plate	(1)
D 17	411 026 2303	SCR S-TPG PAN 3×10	(5)
D 18	411 026 2303	SCR S-TPG PAN 3×10	(3)
D 19	632 160 5955	Coin Case	1
D 20	632 160 9021	Roller, Shaft	2
D 21	411 008 2406	WASHER SPR 6	2

Key No.	SANYO Code	Description	Q'ty
D 22	632 511 3708	Cover, Bottom	1
D 23	411 064 5502	SCR TPG BIN 3×6	2
D 24	632 166 6604	Foot, Rubber	4
D 25	411 008 4509	WASHER V 4×10×0.8	4
D 26	411 064 9906	SCR TPG BIN 4×12	4
D 27	411 006 3207	SCR TPG BIN 4×8	4
D 28	632 160 6662	Bracket	1
D 29	632 105 9765	Bush	1
D 30	632 115 4217	Spring	1
D 31	411 029 4407	SCR S-TPG PAN+FLG 4×10	1
D 32	632 109 0997	Solenoid	1
D 33	632 160 9038	Bracket	1
D 34	632 115 4033	Spring	1
D 35	411 003 8908	SCR PAN+W 3×6	2
D 36	632 160 7348	Cam	1
D 37	632 160 8505	Shaft, Lever	1
D 38	411 016 3808	Ring, E, 5	1
D 39	632 115 4026	Spring	1
D 40	632 160 7454	Shaft, Operation plate	1
D 41	411 016 1200	Ring, E, 3	2
D 42	632 105 9765	BUSH	1
D 43	411 088 3508	WASHER V 6×13×1	1
	632 251 9428	HOUSING, 3P	1
	632 287 0857	TERMINAL, HOUSING	2
	632 527 3600	LABEL, ECB 05C-33	1

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